

COLUMBIA: THE FIRST FIVE FLIGHTS

ENTRY HEATING DATA SERIES

VOLUME 3

THE LOWER WINDWARD SURFACE CENTERLINE

By S. D. Williams

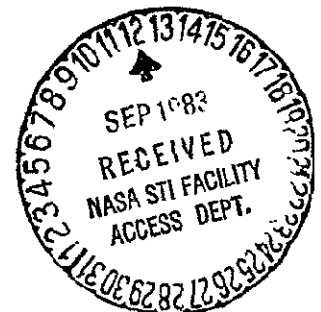
May 1983

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FLIGHTS ENTRY HEATING DATA SERIES., VOLUME  
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## ERRATA

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Entry Heating Data Series  
Volume 3  
The Lower Windward Surface Centerline  
May 1983  
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After publication and distribution of the document listed above it was observed that the numerical values of the Normal Shock Reynolds Numbers flagged on the  $h/h_{ref}$  vs.  $\alpha$  plots were incorrectly labeled. Although the flagged values were correct with respect to time and  $\alpha$  the freestream values instead of the normal shock values were printed. The analyst can obtain the correct value for wind tunnel conditions by multiplying the stated values by 0.1121 or by using the values shown in the following table. This error is consistent for Volumes 2 through 6. The author regrets any inconvenience this has caused for the serious researcher.

Correlation Between Free Stream and Normal Shock—  
Reynolds Numbers at Wind Tunnel Conditions

0.0175 Scale $Re_{\infty} / ft \times 10^6$	107 Ft. Length $Re_{\infty} \times 10^6$	107 Ft. Length $Re_{NS} \times 10^5$
0.50	0.936	1.050
1.00	1.873	2.099
1.50	2.809	3.149
2.00	3.745	4.198
2.50	4.681	5.248
3.00	5.618	6.297
3.50	6.554	7.347
3.70	6.928	7.767

## DISCUSSION:

Over 2,000 design flight instruments (DFI) were installed on Columbia with the majority of the DFI flight data recorded during ascent and entry (Ref. 1). Additional real-time instrumentation was used to continuously monitor the thermal subsystems during each flight. Successful completion of the first five flights of the Space Shuttle Orbiter has provided sufficient data from radiometers, thermocouples, and pressure transducers to appraise the aerothermodynamic/TPS performance.

The entry heating presented in this report is restricted to the Windward Lower Surface Centerline, see Fig. 1. A tabulation of the orbiter X, Y, Z coordinates for each instrument can be found in Table I. The identification of centerline tiles which were catalytically coated for each flight is shown in Table II. This data is presented in two Appendices:

Appendix A: Correlation Parameters

Appendix B: Flight Data

As an aid to the reader, the page numbers for the specific correlation parameters and flight data for each Appendix can be found in Tables III and IV.

The surface heating and temperature data presented in this volume is based on the thermal analysis at each individual location via the JSC NONLIN/INVERSE computer program Ref. 2. Values of angle-of-attack and the derived free stream Mach number were obtained from JSC/MPAD Best Estimated Trajectory (BET) data tapes for each flight. The corresponding data values for Normal Shock Reynolds number (Ref. 3), reference heating rate, reference film coefficient, and total enthalpy were obtained via the MINIVER computer program (Ref. 4). Values of  $h/h_{ref}$  were computed using a  $0.9 H_T$  recovery enthalpy. The comparison of wind tunnel data ( $0.9 H_T$ ) with flight data for V09T9341A ( $X/L=0.026$ ) and V07T9492A ( $X/L=0.99$ ) was obtained by linear interpolation from  $X/L=0.02$  and  $X/L=0.03$ , and  $X/L=0.975$  and  $X/L=1.015$  locations, respectively. All other wind tunnel data was taken at  $X/L$  locations ( $\pm 0.01$ ) corresponding to flight measurement locations.

At the wind tunnel conditions, Mach 8, (Ref. 5) the Normal Shock Reynolds number is .1121 times the Reynolds number based on freestream parameters.

All heating rates were calculated with a view factor of 1. The surface emissivity of all instruments was assumed to be 0.85. All heating rates compared to flight parameters ( $\alpha$ ,  $M_\infty$ , and  $Re_{Ns}$ ) are presented on a log scale with imposed limits of  $10^{-3} \leq h/h_{ref} \leq 1$ . No wind tunnel data is presented for those instruments on the Body Flap since the Body Flap deflection varied during entry. In examining V09T9751A (X/L=.95) the reader should be aware that the surface data was derived from the second in depth thermocouple (0.30 inches from the surface) which is at the limits of the NONLIN/INVERSE programs capability to back out surface phenomena for this material. This data thus appears noisy.

Entry heating data for other vehicle areas is presented in additional volumes. Volume 1: An overview, see Ref. 6, contains the underlying assumptions, detailed trajectory information, and pertinent information for the integration of all subsequent volumes. In order to provide an adequate overview of the entry heating volume 1 will be the last released publication in this series of reports.



## REFERENCES:

1. Smith, J. A., STS-3 Structural and Aerodynamic Pressure and Aerothermodynamics and Thermal Protection System Measurement Locations, NASA JSC 17889, January 15, 1982.
2. Williams, S. D. and Curry, D. M., An Analytical and Experimental Study Using a Single Embedded Thermocouple, J. Spacecraft and Rockets, Vol. 14, October 1977, pp. 632-637.
3. Ried, R. C., Jr.; Goodrich, W. D.; Strouhal, G.; and Curry, D. M.: The Importance of Boundary Layer Transition to the Space Shuttle Design, Proceedings of the Boundary Layer Transition Workshop held Nov. 3-5, 1971. Aerospace Report No. TOR-0172 (S2816-16) -5, Dec. 20, 1971.
4. Hender, D. R., A Miniature Version of the JA70 Aerodynamic Heating Computer Program, H800 (MINIVER) MDC G0462, McDonnell Douglas Astronautics Company Huntington Beach, CA, June 1970, Revised January 1972.
5. Martindale, W. R., Kaul, C. E., and Nutt, K. W., Test Results from the NASA/Rockwell International Space Shuttle Orbiter Heating Test (OH49B) conducted in the AEDC-VKF Tunnel B, AEDC-DR-74-73, VonKarman Gas Dynamics Facility, ARO, Inc., Arnold Engineering Development Center, Arnold Air Force Station, Tennessee, SEpt. 5, 1974.
6. Williams, S. D., Columbia: The First Five Flights Entry Heating Data Series, Volume 1, An Overview

# WINDWARD LOWER SURFACE

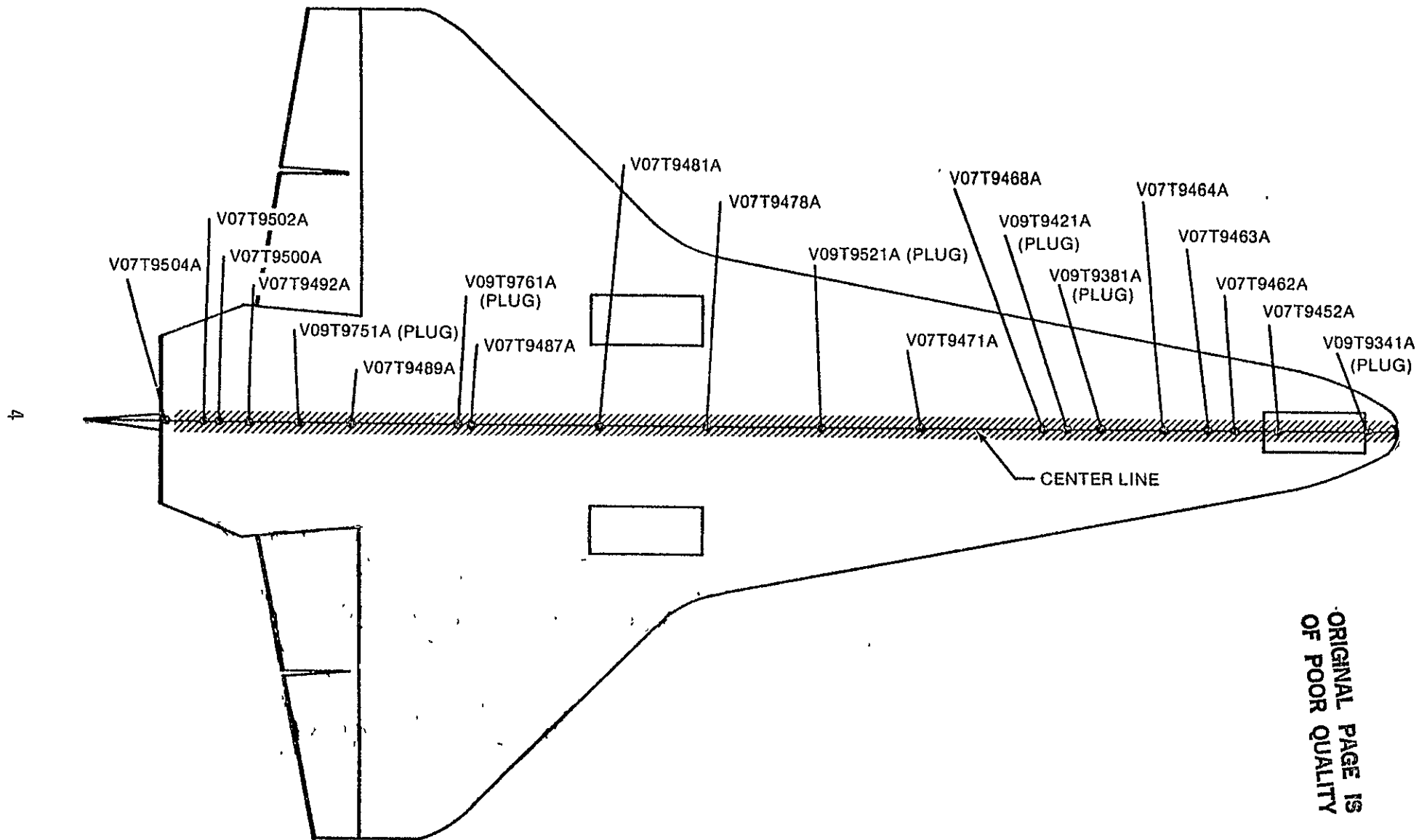


Fig. 1 Centerline Measurement Locations on the Windward Lower Surface

TABLE I  
CENTERLINE COORDINATES

<u>MID</u>	<u>X/L</u>	<u>Xo</u>	<u>Yo</u>
V09T9341A+	0.026	268.0	1.2
V07T9452A	0.099	361.7	-4.9
T9462A	0.141	416.5	0.0
T9463A	0.164	433.5	0.0
T9464A	0.196	486.5	-6.6
V09T9381A+	0.257	565.0	-4.2
T9421A+	0.288	604.7	-8.4
V07T9468A	0.299	618.9	0.0
T9471A	0.404	754.7	0.0
V09T9521A+	0.501	878.9	-12.8
V07T9478A	0.598	1,003.8	0.0
T9481A	0.695	1,128.0	0.0
T9487A	0.802	1,265.0	0.0
V09T9761A+	0.811	1,276.5	-38.2
V07T9489A	0.900	1,391.5	0.0
V09T9751A+	0.952	1,458.2	0.0
V07T9492A	0.993	1,511.1	1.3
T9500A	1.018	1,543.4	0.0
T9502A	1.03	1,560.3	0.0
T9504A	1.069	1,608.4	0.0

+ Plug instrumented

TABLE II

## Catalytic Tiles for Difference Flights\*

MID	X/L	Flight which the tile was catalytic			
V07T9452A	0.10		STS-4		STS-5
9463	0.16	STS-2			STS-5
9464	0.20		STS-4		STS-5
9468	0.30		STS-3	STS-4	STS-5
9471	0.40	STS-2	STS-3	STS-4	STS-5
9478	0.60				STS-5

\*This was a OEX catalytic experiment conducted by Dave Stewart, AMES Research Center.

TABLE III  
PAGE NUMBERS FOR APPENDIX A:  
CORRELATION PARAMETERS

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STS - Flight

Flight Parameter			STS-1	STS-2	STS-3	STS-4	STS-5
$\alpha$	vs	t	1	2	3	4	5
$M_\infty$	vs	t	6	7	8	9	10
$Re_{ns}$	vs	t	11	12	13	14	15
$\alpha$	vs	$M_\infty$	16	17	18	19	20
$\alpha$	vs	$Re_{Ns}$	21	22	23	24	25
$M_\infty$	vs	$Re_{Ns}$	26	27	28	29	30
$\dot{q}_{ref}$	vs	t	31	32	33	34	35
$\dot{q}_{ref}$	vs	$\alpha$	36	37	38	39	40
$\dot{q}_{ref}$	vs	$M_\infty$	41	42	43	44	45
$\dot{q}_{ref}$	vs	$Re_{Ns}$	46	47	48	49	50
$h_{ref}$	vs	t	51	52	53	54	55
$h_{ref}$	vs	$\alpha$	56	57	58	59	60
$h_{ref}$	vs	$M_\infty$	61	62	63	64	65
$h_{ref}$	vs	$Re_{Ns}$	66	67	68	69	70

Table IV - Page Numbers for Appendix B: Flight Data

STS - Flight

Measurement				STS-1	STS-2	STS-3	STS-4	STS-5
V09T9341A	- $h/h_{ref}$	vs	$\alpha$	1	2	3	4	5
	- $h/h_{ref}$	vs	$M_{\infty}$	6	7	8	9	10
	- $h/h_{ref}$	vs	$Re$	11	12	13	14	15
	- $\dot{q}_{ref}$	vs	$t$ NS	16	17	18	19	20
	- $T_{conv}$	vs	$t$	21	22	23	24	25
	- $T_s$	vs						
V07T9452A	- $h/h_{ref}$	vs	$\alpha$	26	27	28	29	30
	- $h/h_{ref}$	vs	$M_{\infty}$	31	32	33	34	35
	- $h/h_{ref}$	vs	$Re$	36	37	38	39	40
	- $\dot{q}_{ref}$	vs	$t$ NS	41	42	43	44	45
	- $T_{conv}$	vs	$t$	46	47	48	49	50
	- $T_s$	vs						
V07T9462A	- $h/h_{ref}$	vs	$\alpha$	51	n/a	52	53	54
	- $h/h_{ref}$	vs	$M_{\infty}$	55	n/a	56	57	58
	- $h/h_{ref}$	vs	$Re$	59	n/a	60	61	62
	- $\dot{q}_{ref}$	vs	$t$ NS	63	n/a	64	65	66
	- $T_{conv}$	vs	$t$	67	n/a	68	69	70
	- $T_s$	vs						
V07T9463A	- $h/h_{ref}$	vs	$\alpha$	71	72	73	84	75
	- $h/h_{ref}$	vs	$M_{\infty}$	76	77	78	79	80
	- $h/h_{ref}$	vs	$Re$	81	82	83	84	85
	- $\dot{q}_{ref}$	vs	$t$ NS	86	87	88	89	90
	- $T_{conv}$	vs	$t$	91	92	93	94	95
	- $T_s$	vs						
V07T9464A	- $h/h_{ref}$	vs	$\alpha$	96	97	98	99	100
	- $h/h_{ref}$	vs	$M_{\infty}$	101	102	103	104	105
	- $h/h_{ref}$	vs	$Re$	106	107	108	109	110
	- $\dot{q}_{ref}$	vs	$t$ NS	111	112	113	114	115
	- $T_{conv}$	vs	$t$	116	117	118	119	120
	- $T_s$	vs						
V09T9381A	- $h/h_{ref}$	vs	$\alpha$	121	122	123	124	125
	- $h/h_{ref}$	vs	$M_{\infty}$	126	127	128	129	130
	- $h/h_{ref}$	vs	$Re$	131	132	133	134	135
	- $\dot{q}_{ref}$	vs	$t$ NS	136	137	138	139	140
	- $T_{conv}$	vs	$t$	141	142	143	144	145
	- $T_s$	vs						

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Table IV - Continued

				STS - Flight				
Measurement				STS-1	STS-2	STS-3	STS-4	STS-5
V09T9421A	- $h/h_{ref}$	vs	$\alpha$	n/a	146	147	n/a	n/a
	- $h/h_{ref}$	vs	$M_{\infty}$	n/a	148	149	n/a	n/a
	- $h/h_{ref}$	vs	$Re$	n/a	150	151	n/a	n/a
	- $\dot{q}_{conv}$	vs	$t$	n/a	152	153	n/a	n/a
	- $T_s$	vs	$t$	n/a	154	155	n/a	n/a
V07T9463A	- $h/h_{ref}$	vs	$\alpha$	156	157	158	159	160
	- $h/h_{ref}$	vs	$M_{\infty}$	161	162	163	164	165
	- $h/h_{ref}$	vs	$Re$	166	167	168	169	170
	- $\dot{q}_{conv}$	vs	$t$	171	172	173	174	175
	- $T_s$	vs	$t$	176	177	178	179	180
V07T9471A	- $h/h_{ref}$	vs	$\alpha$	181	182	183	184	185
	- $h/h_{ref}$	vs	$M_{\infty}$	186	187	188	189	190
	- $h/h_{ref}$	vs	$Re$	191	192	193	194	195
	- $\dot{q}_{conv}$	vs	$t$	196	197	198	199	200
	- $T_s$	vs	$t$	201	202	203	204	205
V09T9521A	- $h/h_{ref}$	vs	$\alpha$	206	207	208	209	210
	- $h/h_{ref}$	vs	$M_{\infty}$	211	212	213	214	215
	- $h/h_{ref}$	vs	$Re$	216	217	218	219	220
	- $\dot{q}_{conv}$	vs	$t$	221	222	223	224	225
	- $T_s$	vs	$t$	226	227	228	229	230
V07T9478A	- $h/h_{ref}$	vs	$\alpha$	n/a	231	232	233	234
	- $h/h_{ref}$	vs	$M_{\infty}$	n/a	235	236	237	238
	- $h/h_{ref}$	vs	$Re$	n/a	239	240	241	242
	- $\dot{q}_{conv}$	vs	$t$	n/a	243	244	245	246
	- $T_s$	vs	$t$	n/a	247	248	249	250
V07T9481A	- $h/h_{ref}$	vs	$\alpha$	251	252	253	254	255
	- $h/h_{ref}$	vs	$M_{\infty}$	256	257	258	259	260
	- $h/h_{ref}$	vs	$Re$	261	262	263	264	265
	- $\dot{q}_{conv}$	vs	$t$	266	267	268	269	270
	- $T_s$	vs	$t$	271	272	273	274	275

Table IV - Continued

				STS - Flight				
Measurement				STS-1	STS-2	STS-3	STS-4	STS-5
V07T9487A	- $h/h_{ref}$	vs	$\alpha$	276	277	273	279	280
	- $h/h_{ref}$	vs	$M_{\infty}$	281	282	283	284	285
	- $h/h_{ref}$	vs	$Re$	286	287	288	289	290
	- $\dot{q}_{conv}$	vs	$t$ NS	291	292	293	294	295
	- $T_s$	vs	$t$	296	297	298	299	300
V09T9761A	- $h/h_{ref}$	vs	$\alpha$	303	302	303	304	305
	- $h/h_{ref}$	vs	$M_{\infty}$	306	307	303	309	310
	- $h/h_{ref}$	vs	$Re$ NS	311	312	313	314	315
	- $\dot{q}_{conv}$	vs	$t$	316	317	318	319	320
	- $T_s$	vs	$t$	321	322	323	324	325
V07T9489A	- $h/h_{ref}$	vs	$\alpha$	326	327	328	329	330
	- $h/h_{ref}$	vs	$M_{\infty}$	331	332	333	334	335
	- $h/h_{ref}$	vs	$Re$ NS	336	337	338	339	340
	- $\dot{q}_{conv}$	vs	$t$	341	342	343	344	345
	- $T_s$	vs	$t$	346	347	348	349	350
V09T9751A	- $h/h_{ref}$	vs	$\alpha$	351	352	353	354	355
	- $h/h_{ref}$	vs	$M_{\infty}$	356	357	358	359	360
	- $h/h_{ref}$	vs	$Re$ NS	361	362	363	364	365
	- $\dot{q}_{conv}$	vs	$t$	366	367	368	369	370
	- $T_s$	vs	$t$	371	372	373	374	375
V07T9492A	- $h/h_{ref}$	vs	$\alpha$	376	377	378	379	380
	- $h/h_{ref}$	vs	$M_{\infty}$	381	382	383	384	385
	- $h/h_{ref}$	vs	$Re$ NS	386	387	388	389	390
	- $\dot{q}_{conv}$	vs	$t$	391	392	393	394	395
	- $T_s$	vs	$t$	396	397	398	399	400
V07T9500A	- $h/h_{ref}$	vs	$\alpha$	401	402	403	404	405
	- $h/h_{ref}$	vs	$M_{\infty}$	406	407	408	409	410
	- $h/h_{ref}$	vs	$Re$ NS	411	412	413	414	415
	- $\dot{q}_{conv}$	vs	$t$	416	417	418	419	420
	- $T_s$	vs	$t$	421	422	423	424	425



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Table IV - Continued

STS - Flight

Measurement				STS-1	STS-2	STS-3	STS-4	STS-5
V07T9502A	- $h/h_{ref}$	vs	$\alpha$	426	427	428	429	430
	- $h/h_{ref}$	vs	$M_{\infty}$	431	432	433	434	435
	- $h/h_{ref}$	vs	$Re$	436	437	438	439	440
	- $\dot{q}_{conv}$	vs	$t$ NS	441	442	443	444	445
	- $T_s$	vs	$t$	446	447	448	449	450
V07T9504A	- $h/h_{ref}$	vs	$\alpha$	451	452	453	454	455
	- $h/h_{ref}$	vs	$M_{\infty}$	456	457	458	459	460
	- $h/h_{ref}$	vs	$Re$	461	462	463	464	465
	- $\dot{q}_{conv}$	vs	$t$ NS	466	467	468	469	470
	- $T_s$	vs	$t$	471	472	473	474	475

APPENDIX A  
CORRELATION PARAMETERS

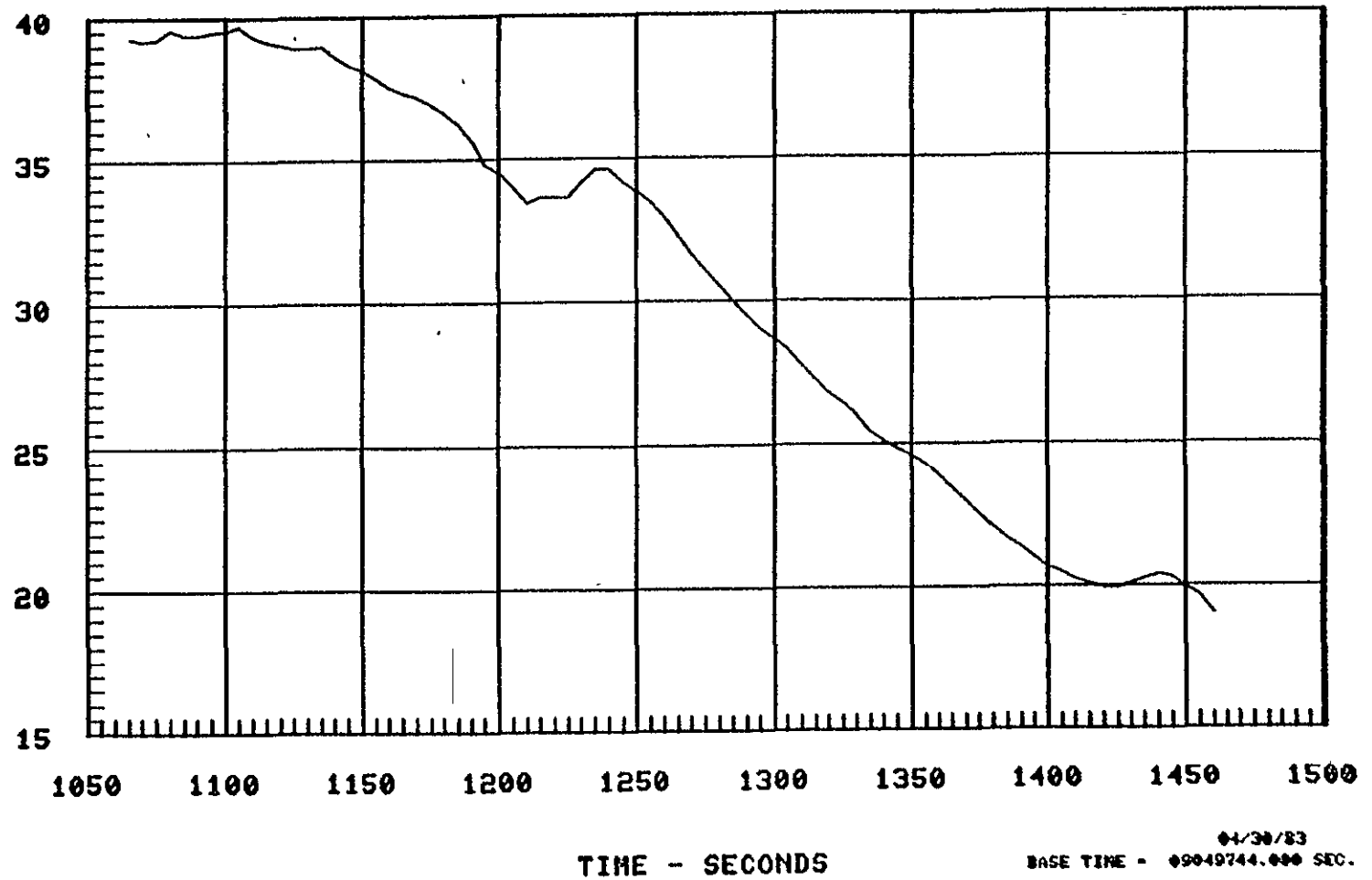
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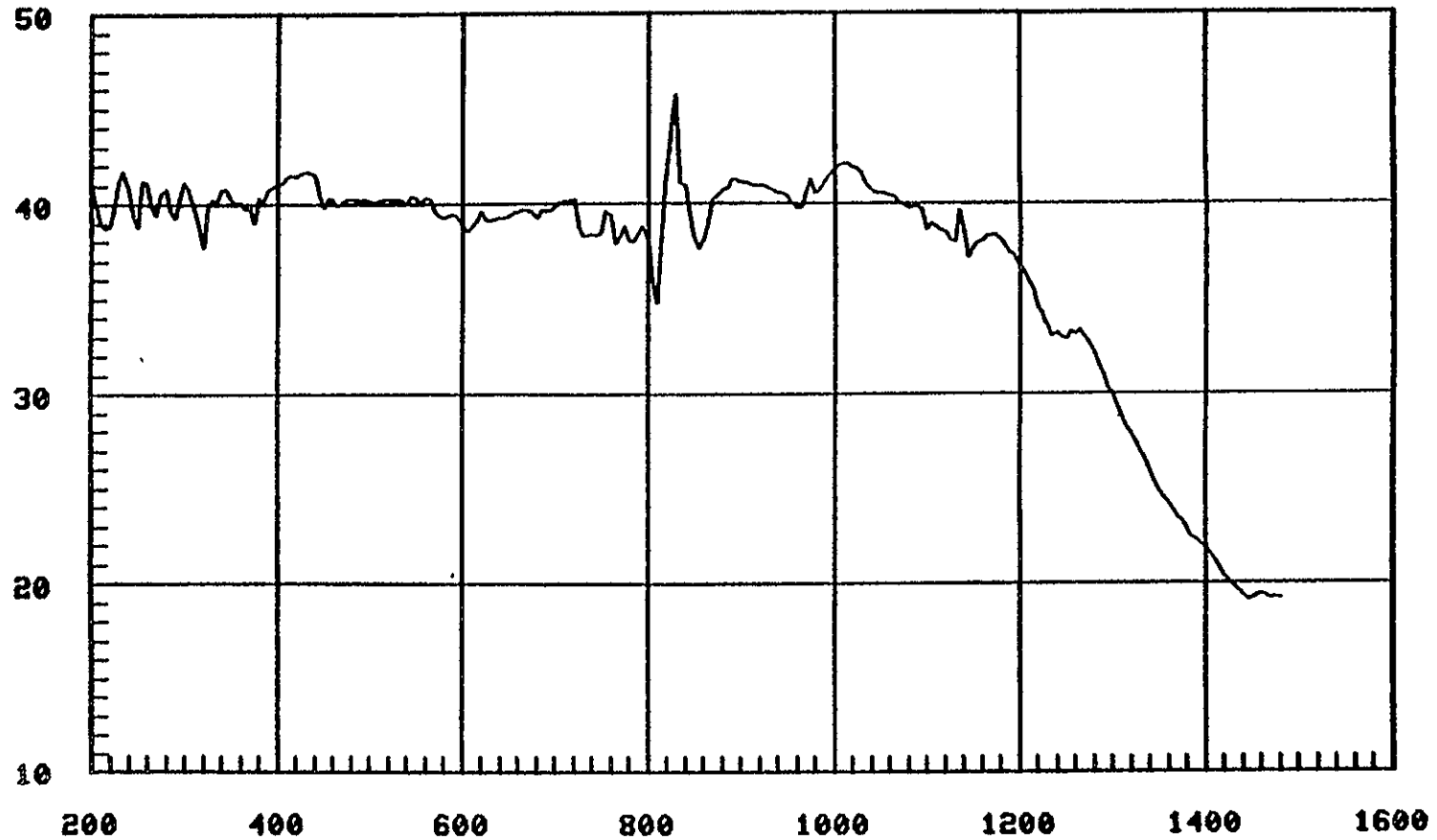


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STS-2

200-1480 SEC

ACCELERATION - G



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TIME - SECONDS

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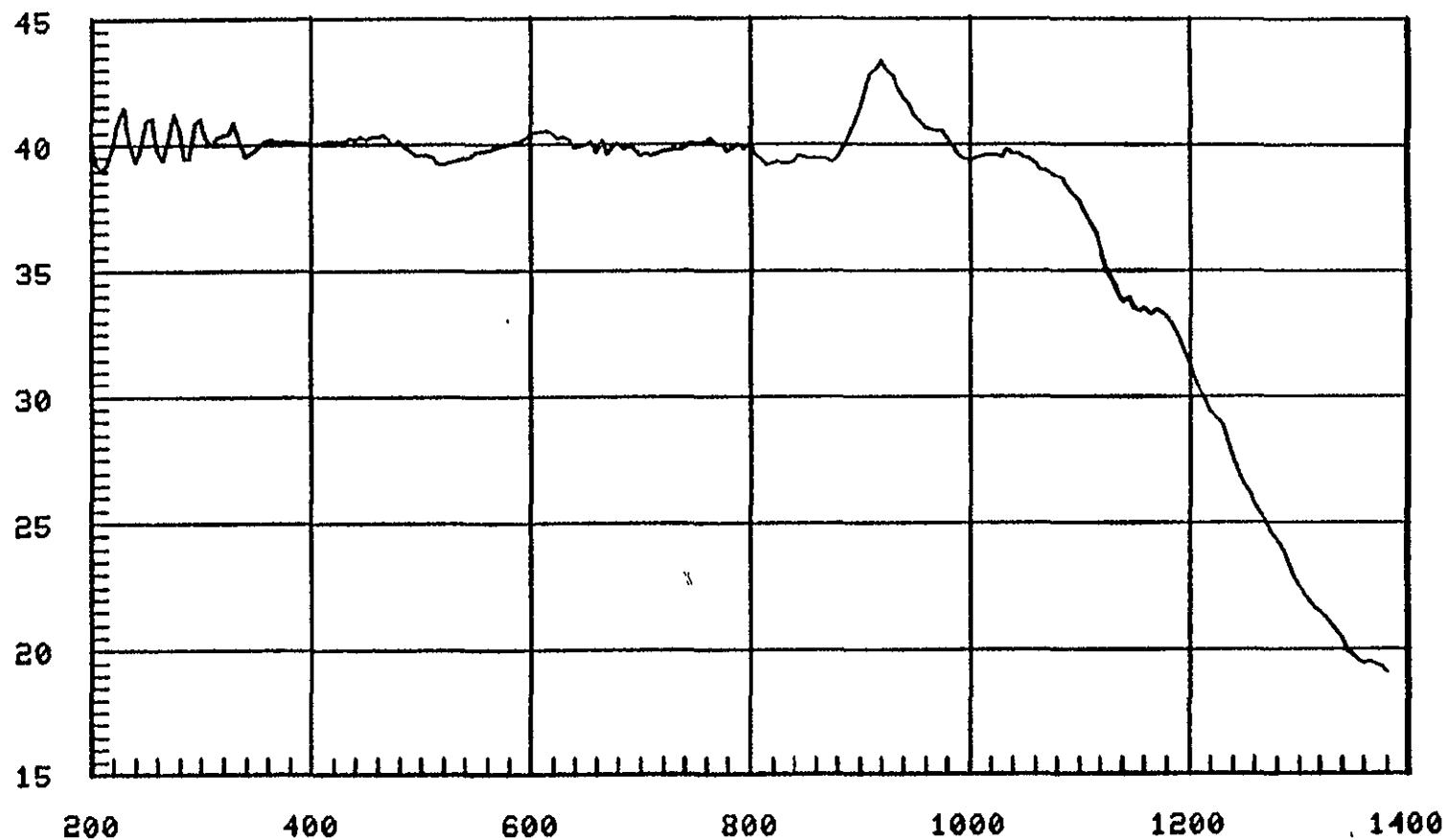
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200-1380 SEC

EXCELLENCE - 200

A-3

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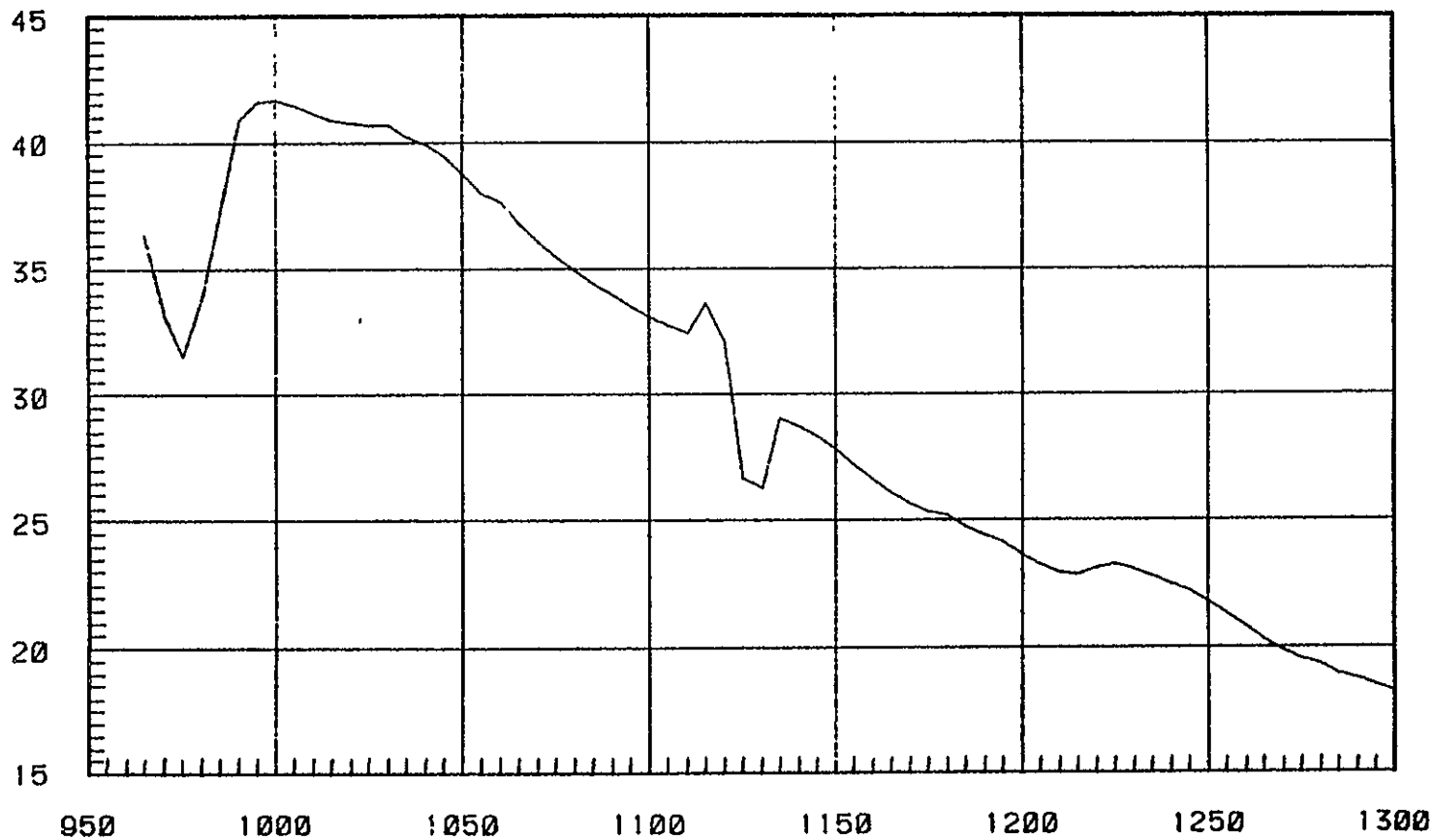
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ANGLE-OF-ATTACK - DEG

A-4



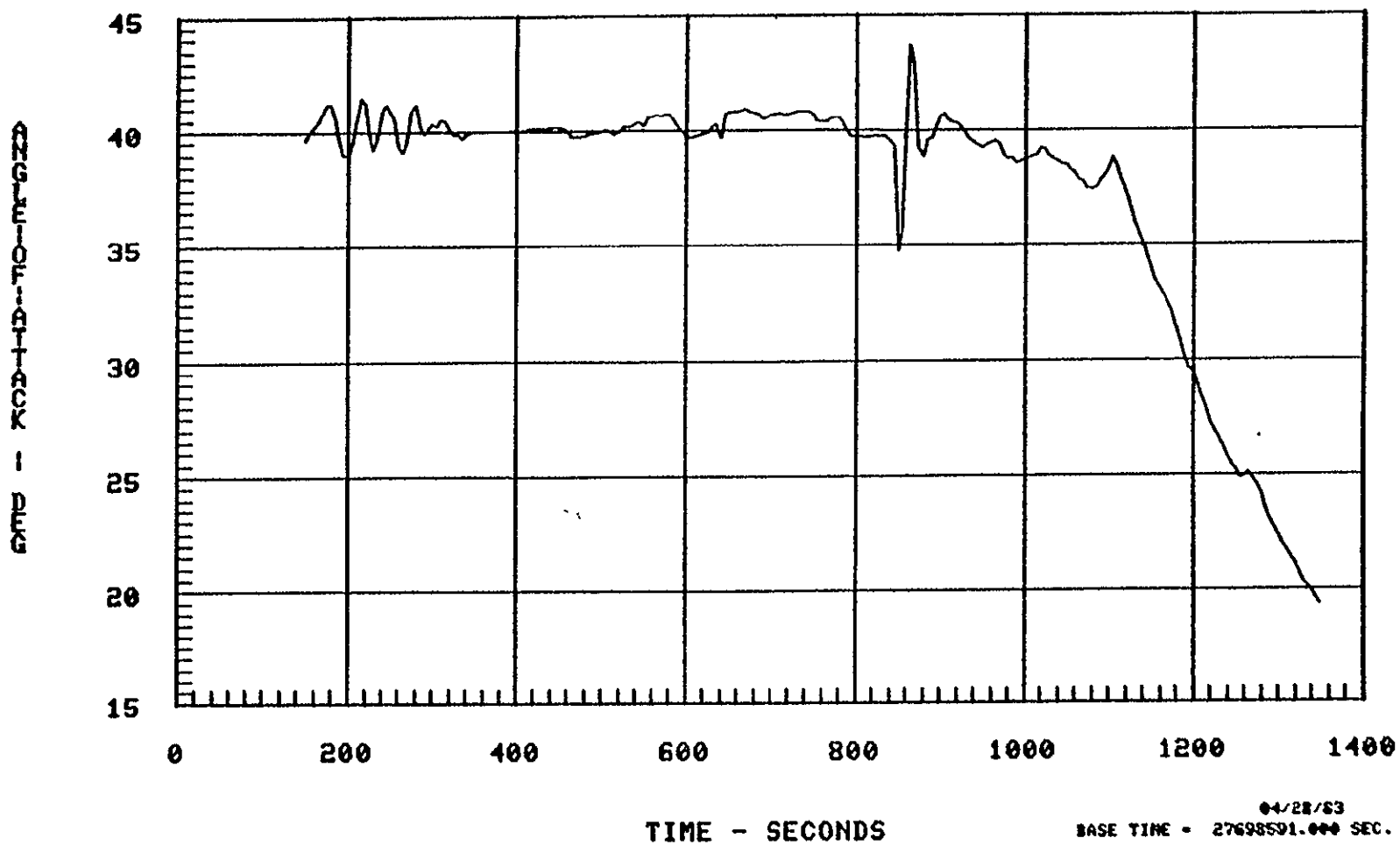
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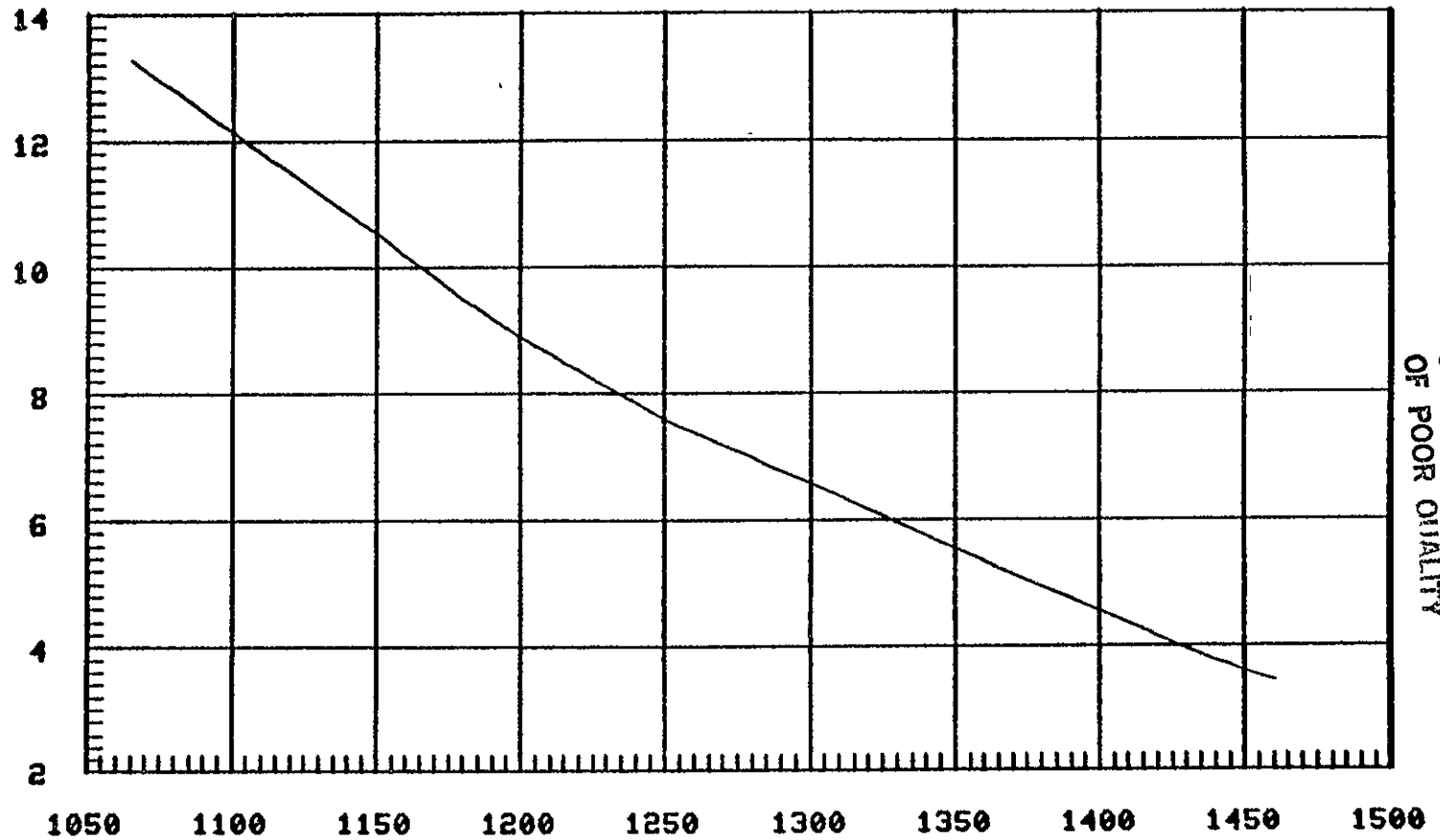
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# STS-1 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-1

1065-1460 SEC

HEIGHT - FEET



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TIME - SECONDS

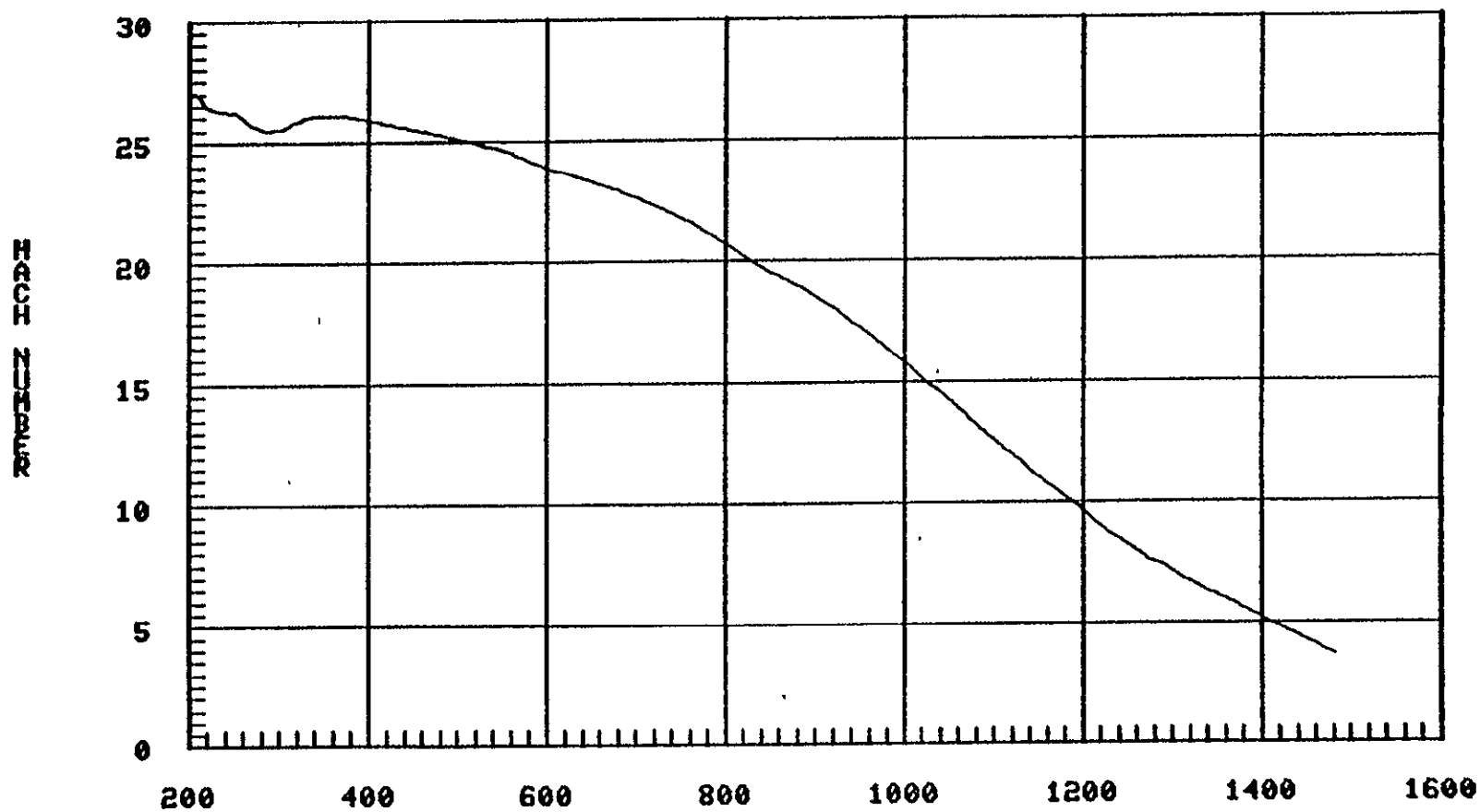
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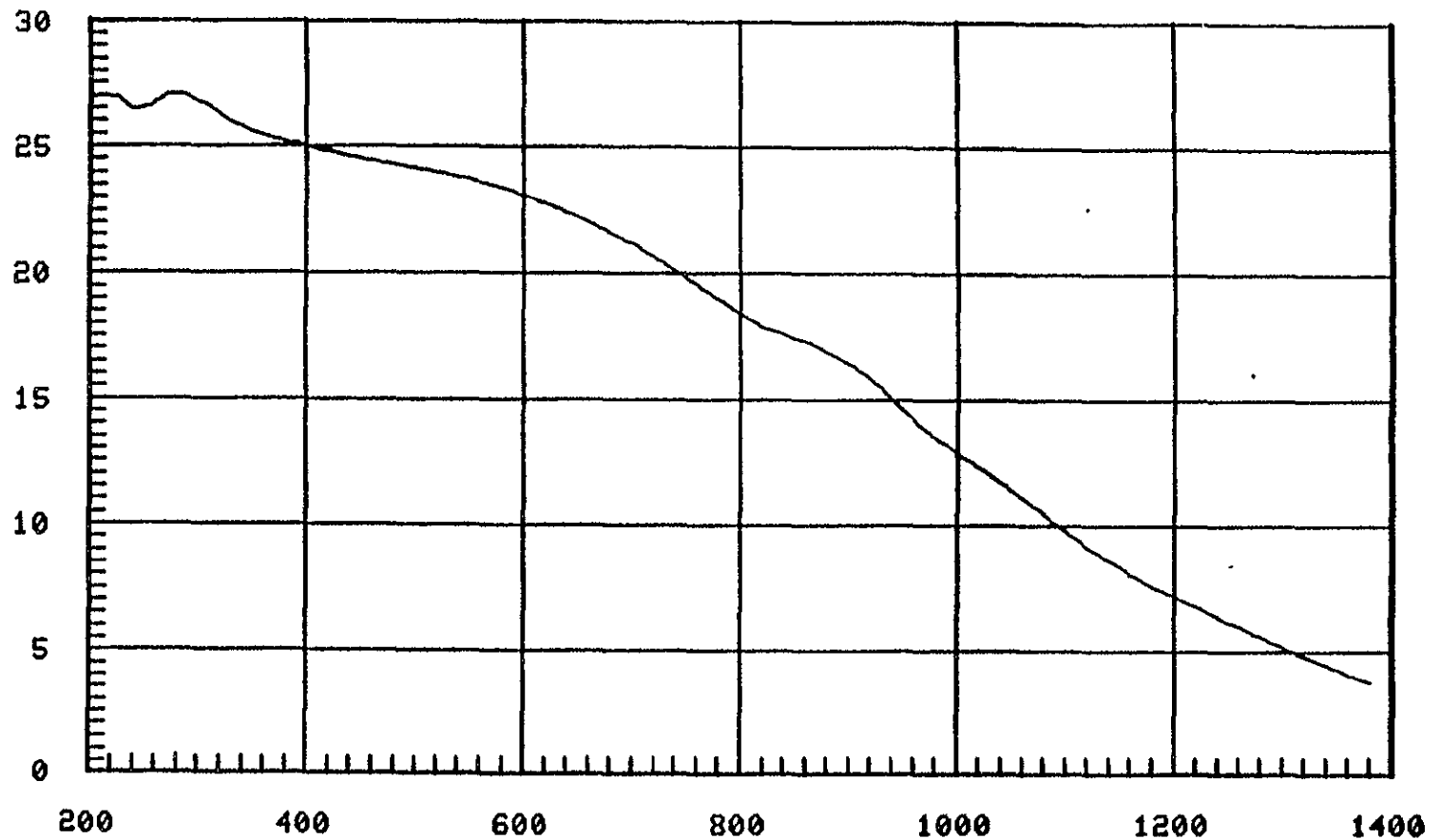
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———— STS-3

200-1380 SEC



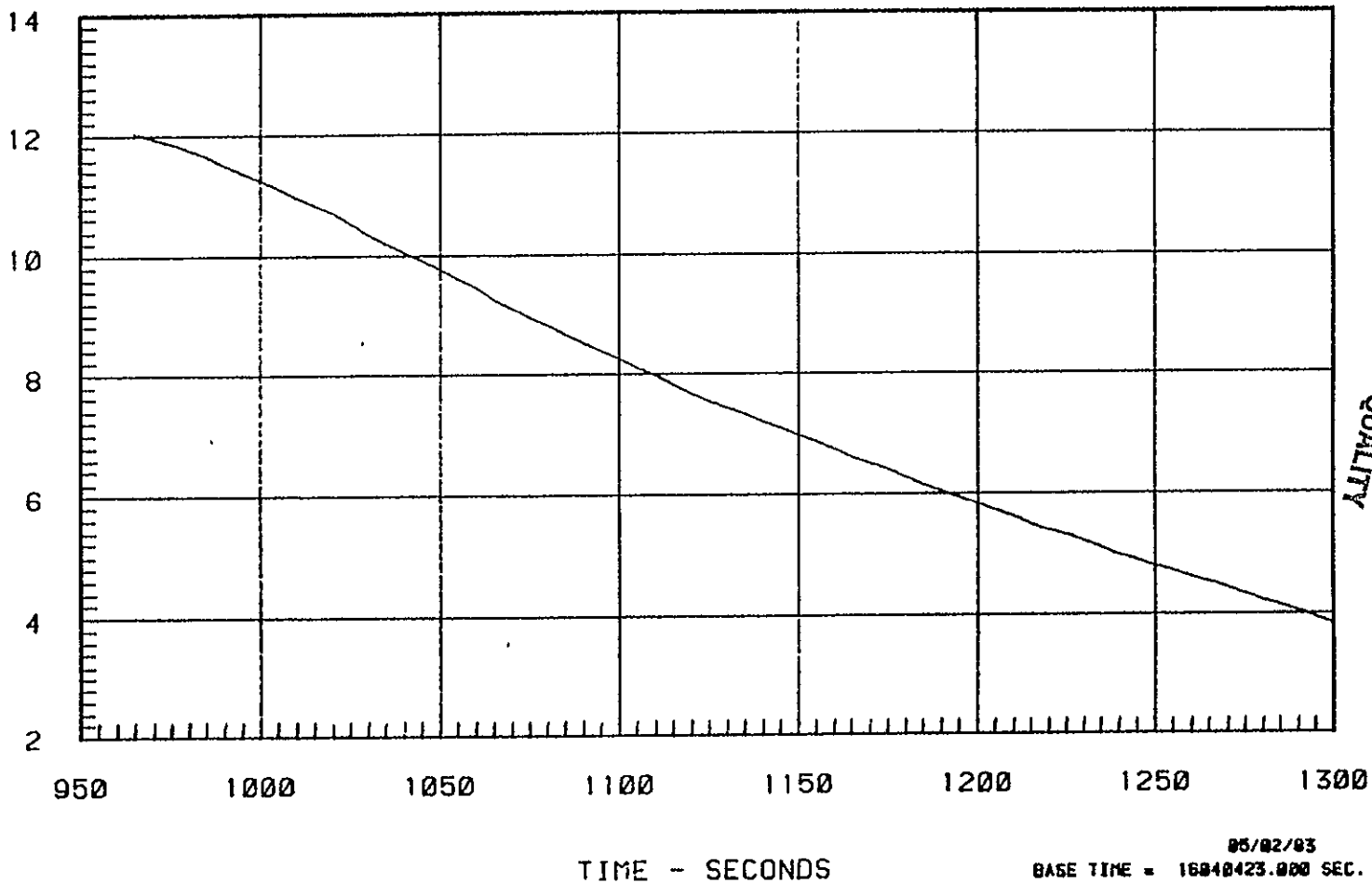
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STG-4

865-1300 SEC



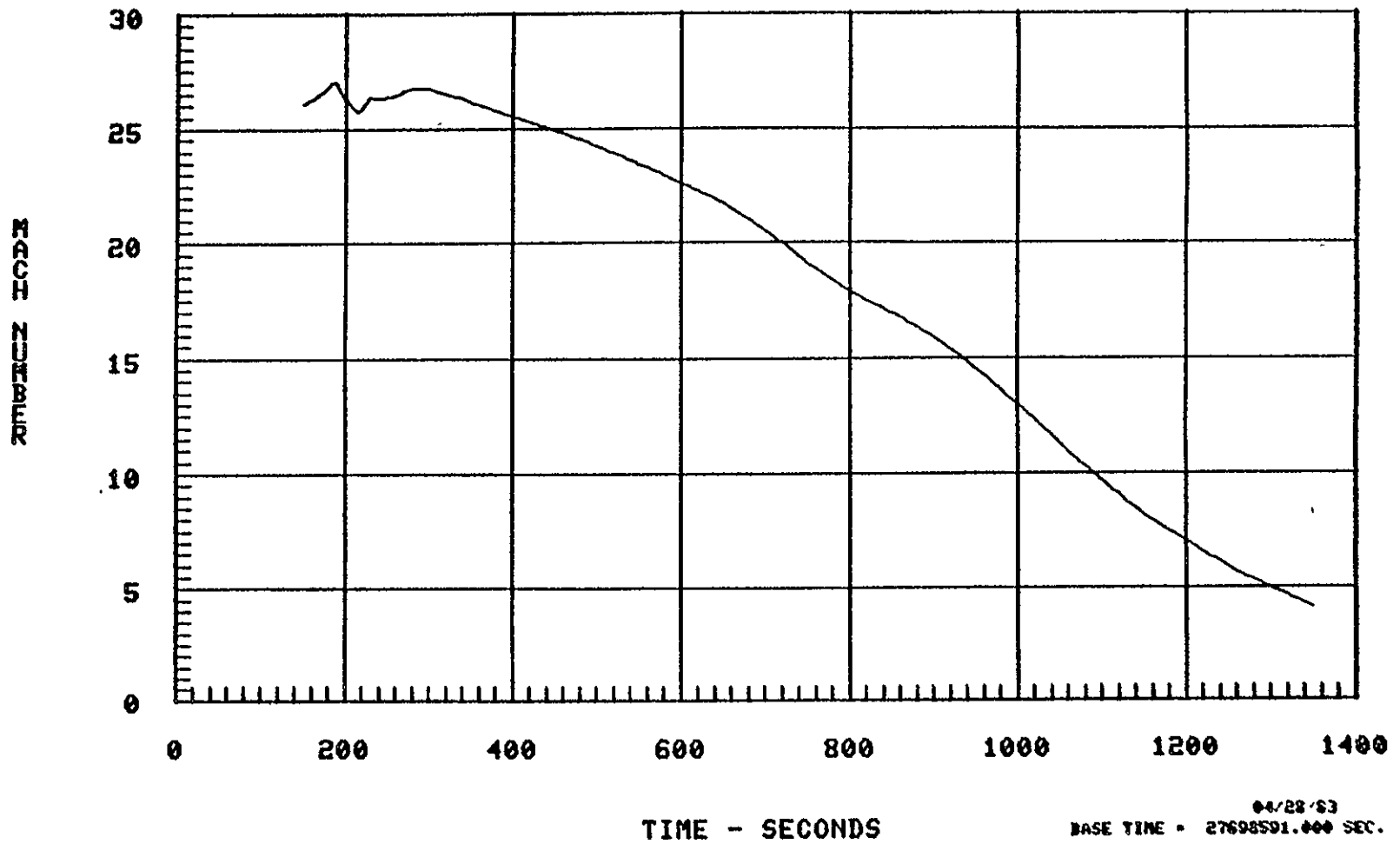
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# STS-5 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

———— STS-5 150-1350 SEC

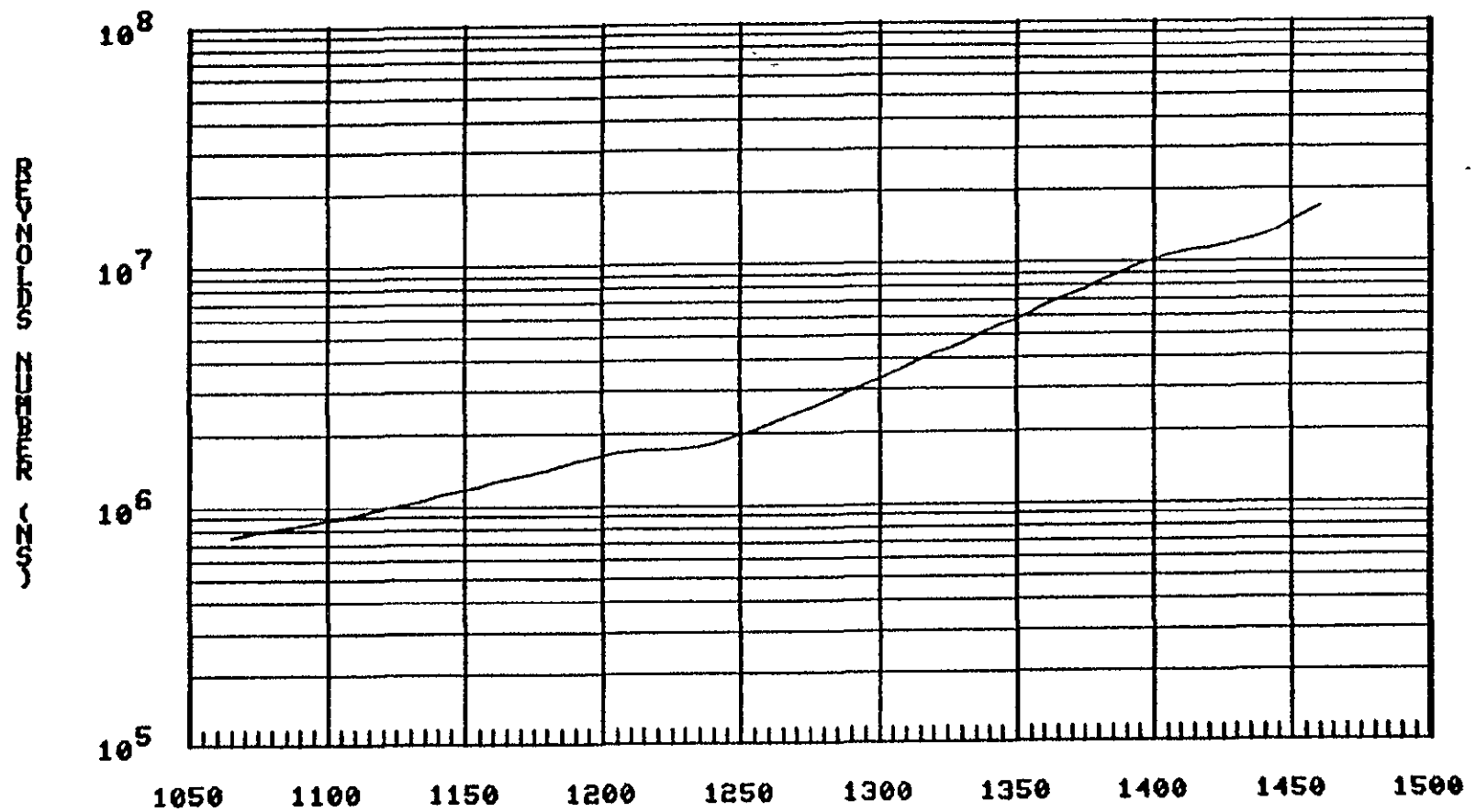


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# STS-1 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-1

1065-1460 SEC



A-11

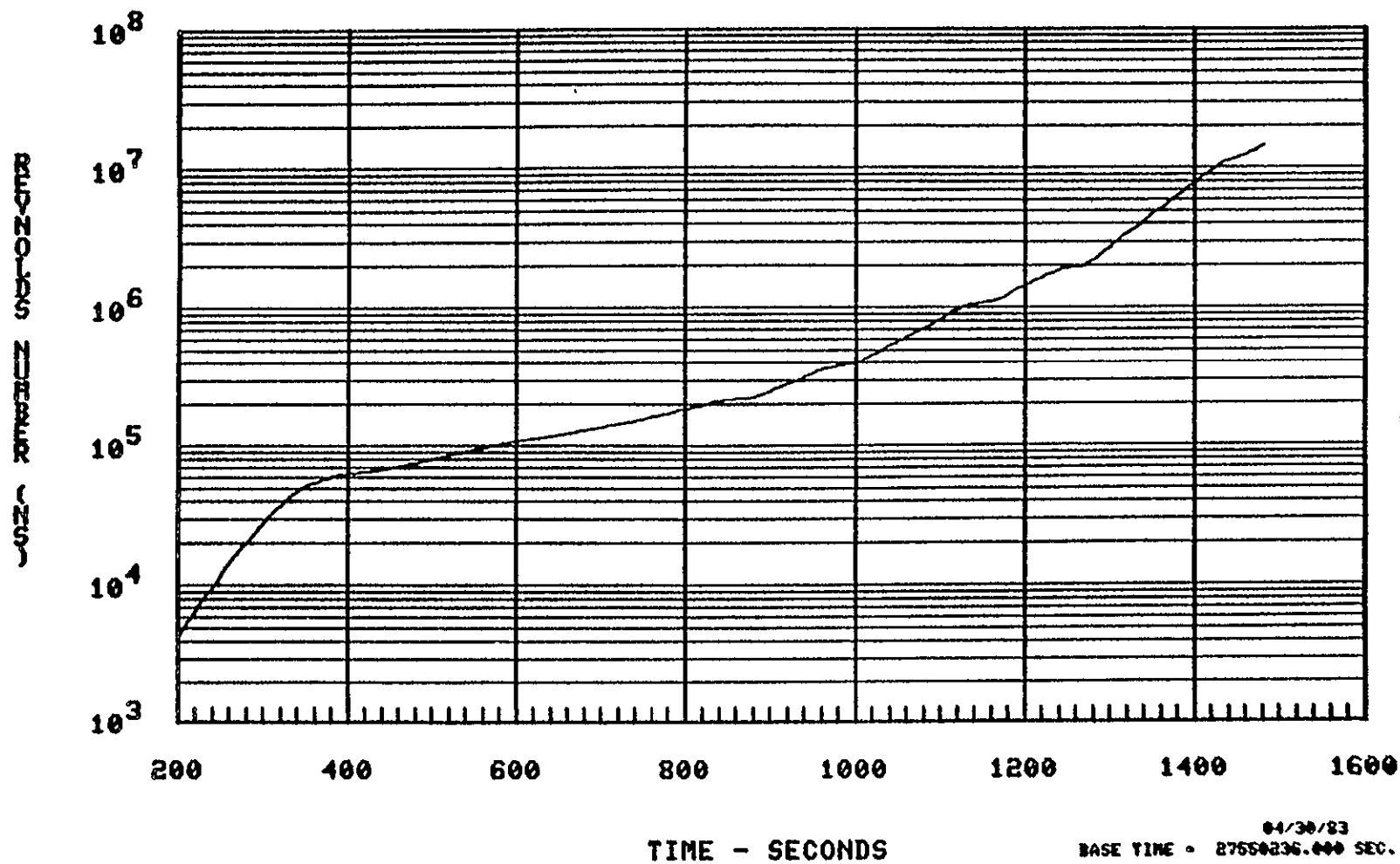
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TIME - SECONDS

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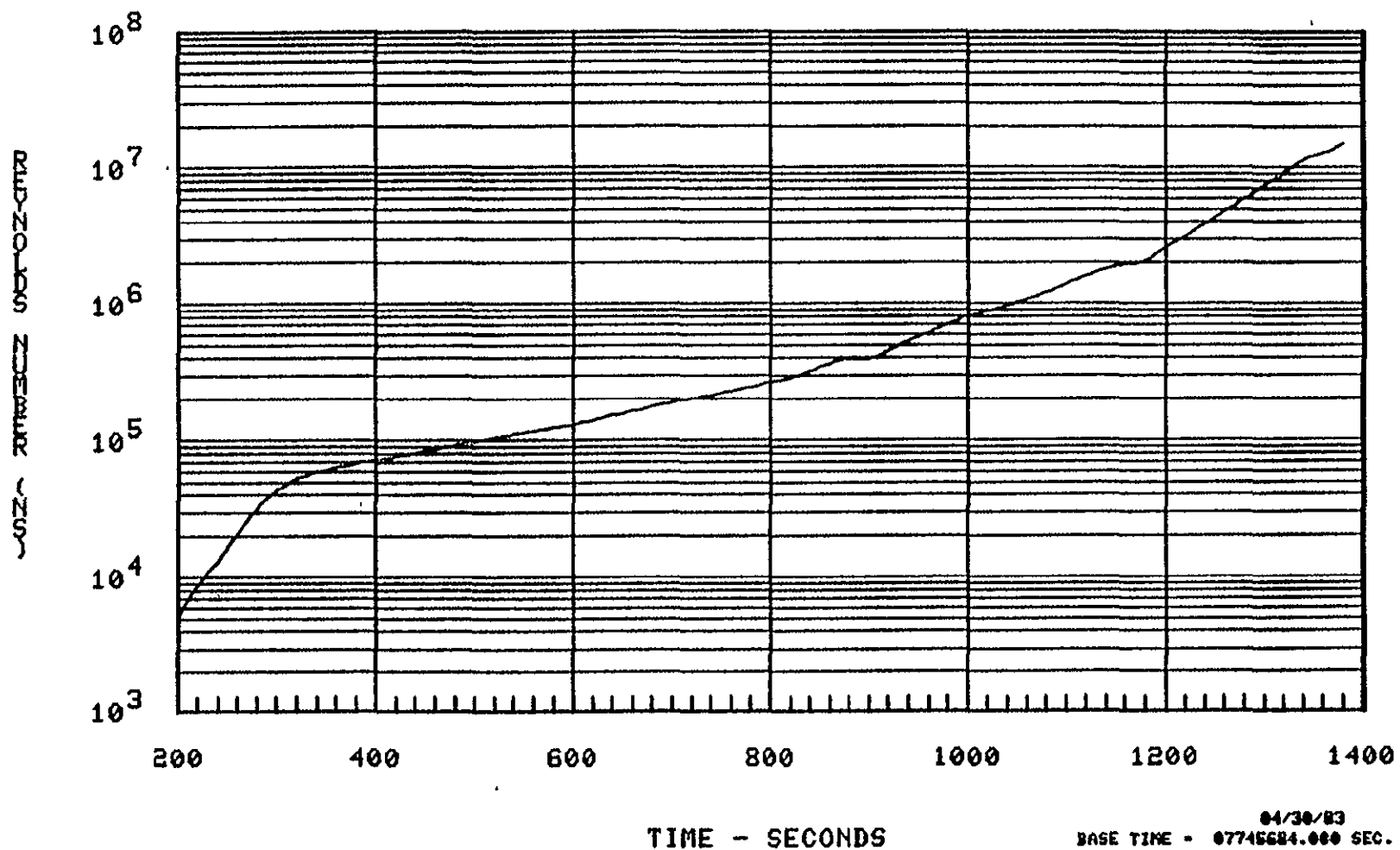
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# STS-3 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-3

200-1380 SEC

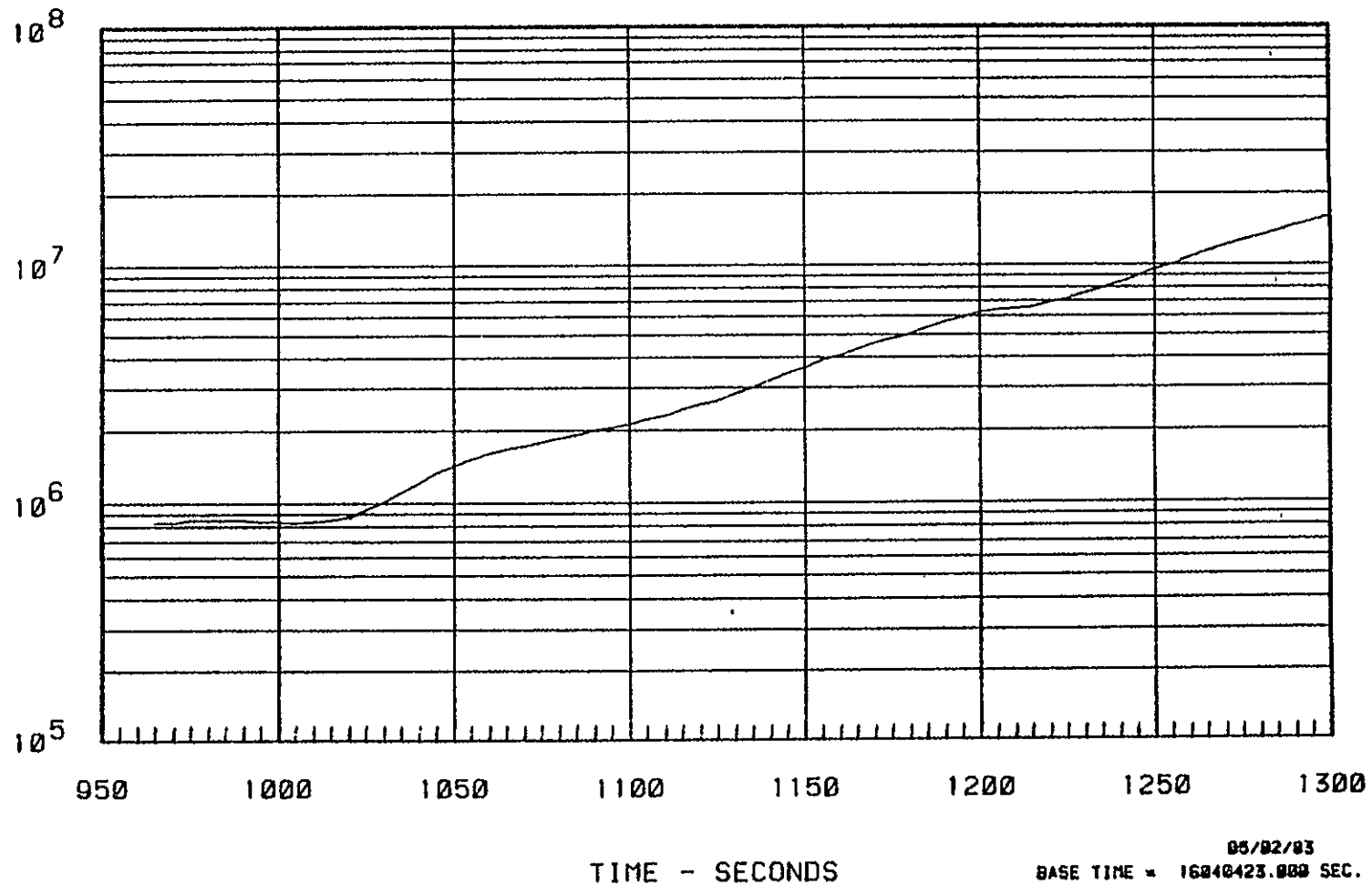


# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

—————

STS-4

065-1300 SEC



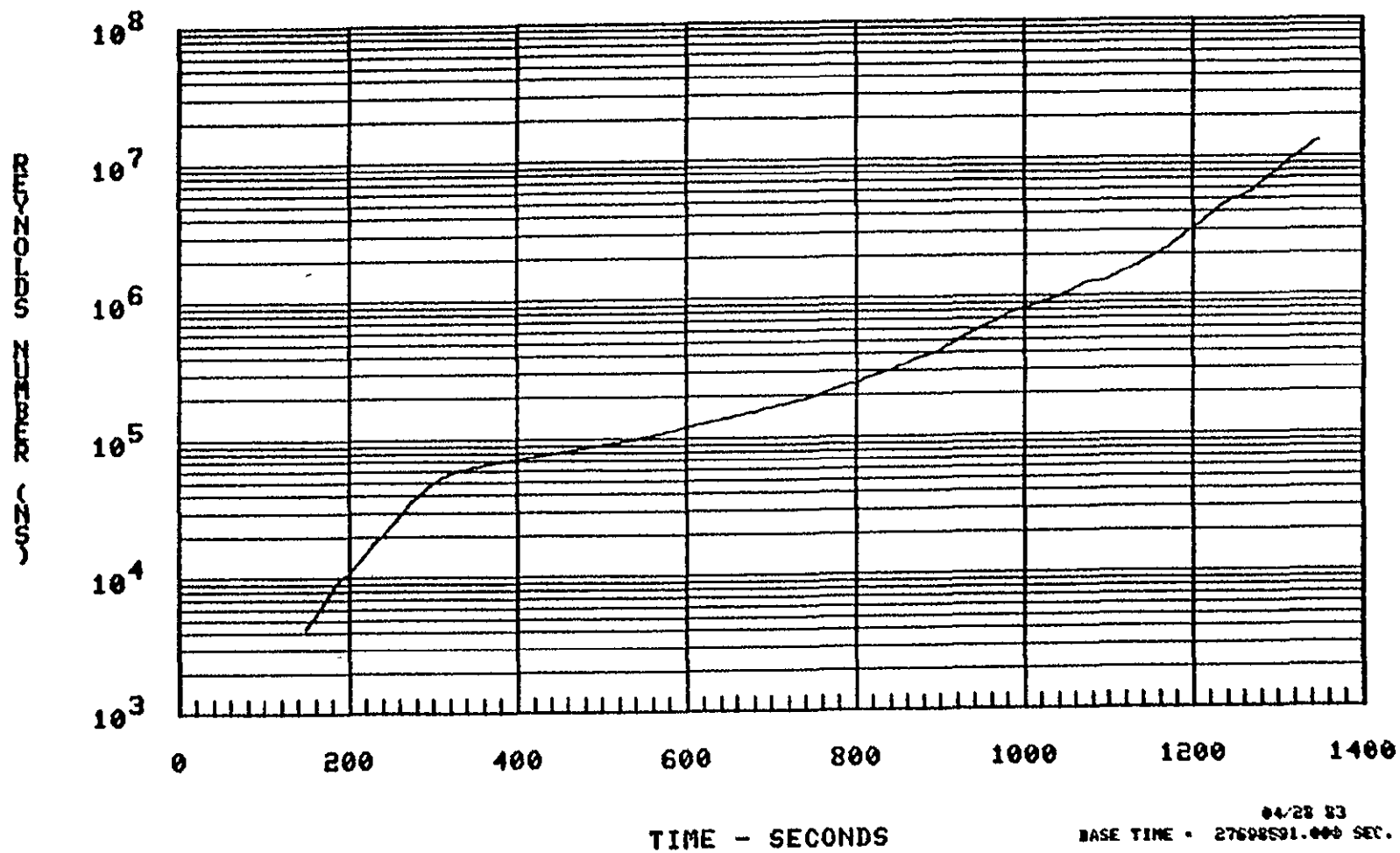
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# STS-5 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-5

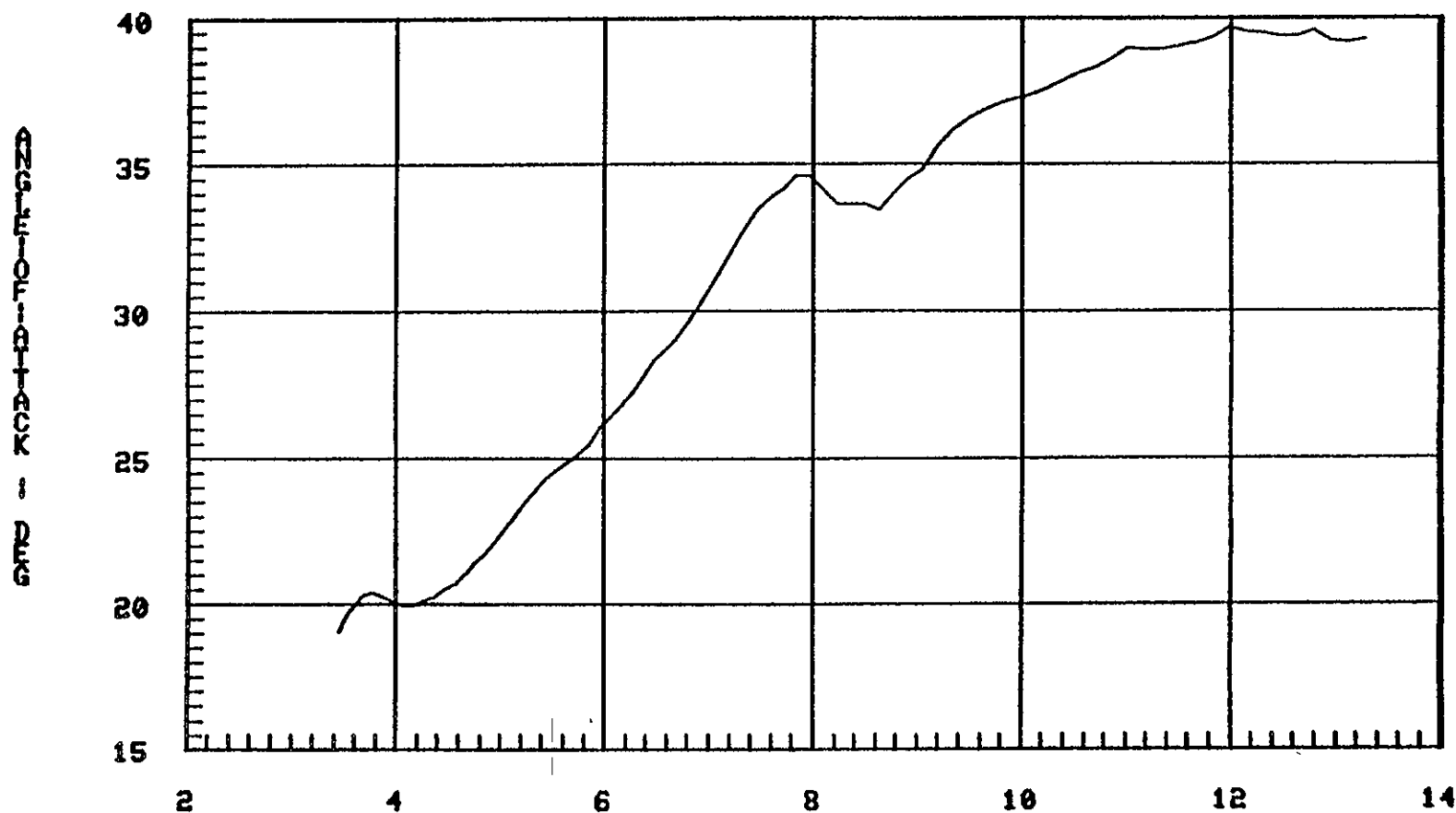
150-1350 SEC



# STS-1 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-1

1065-1460 SEC



MACH NUMBER

04/30/83  
BASE TIME = 09049744.000 SEC.

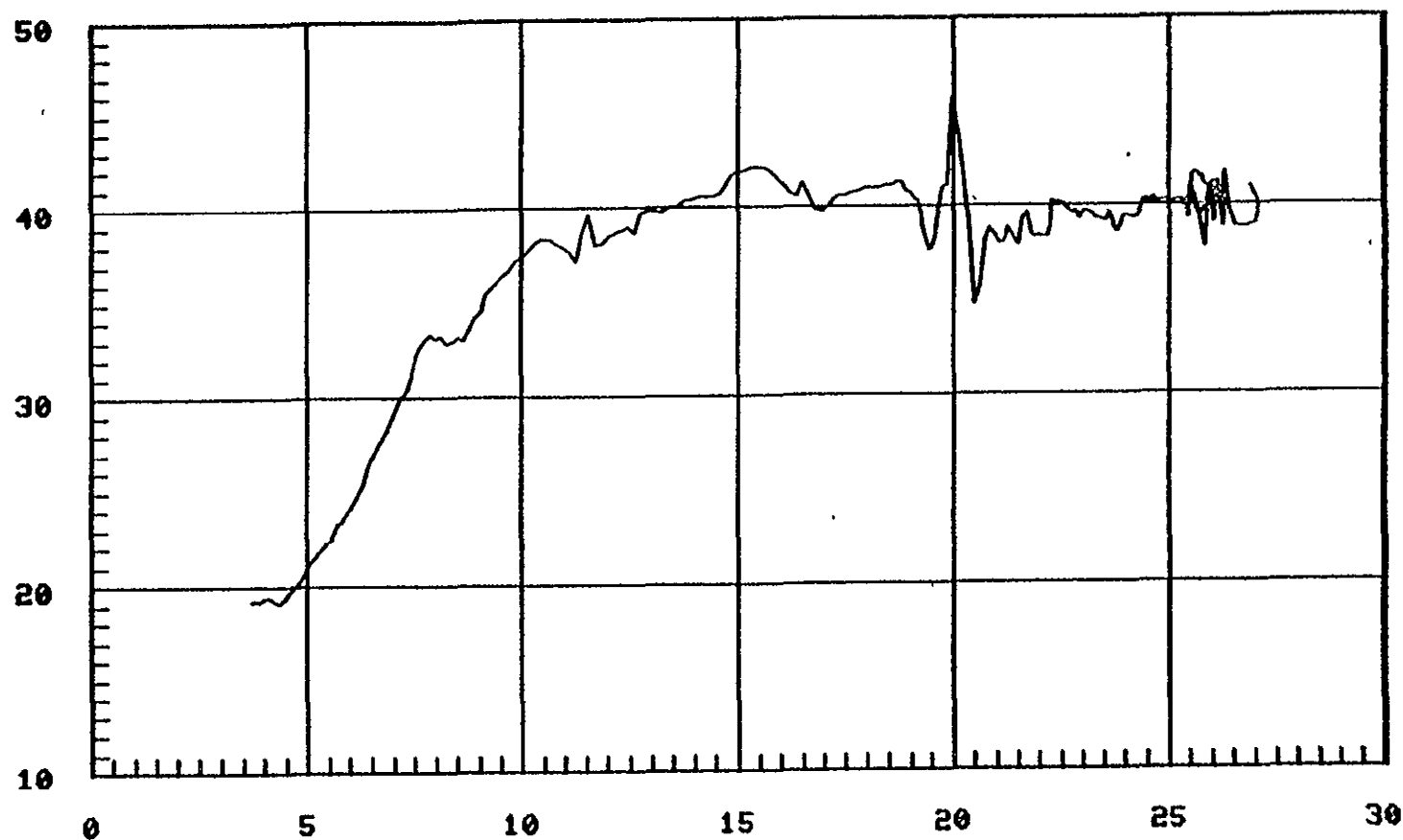
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# STS-2 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-2

200-1480 SEC

020-31-01-01-001 - AUG



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MACH NUMBER

04/30/83  
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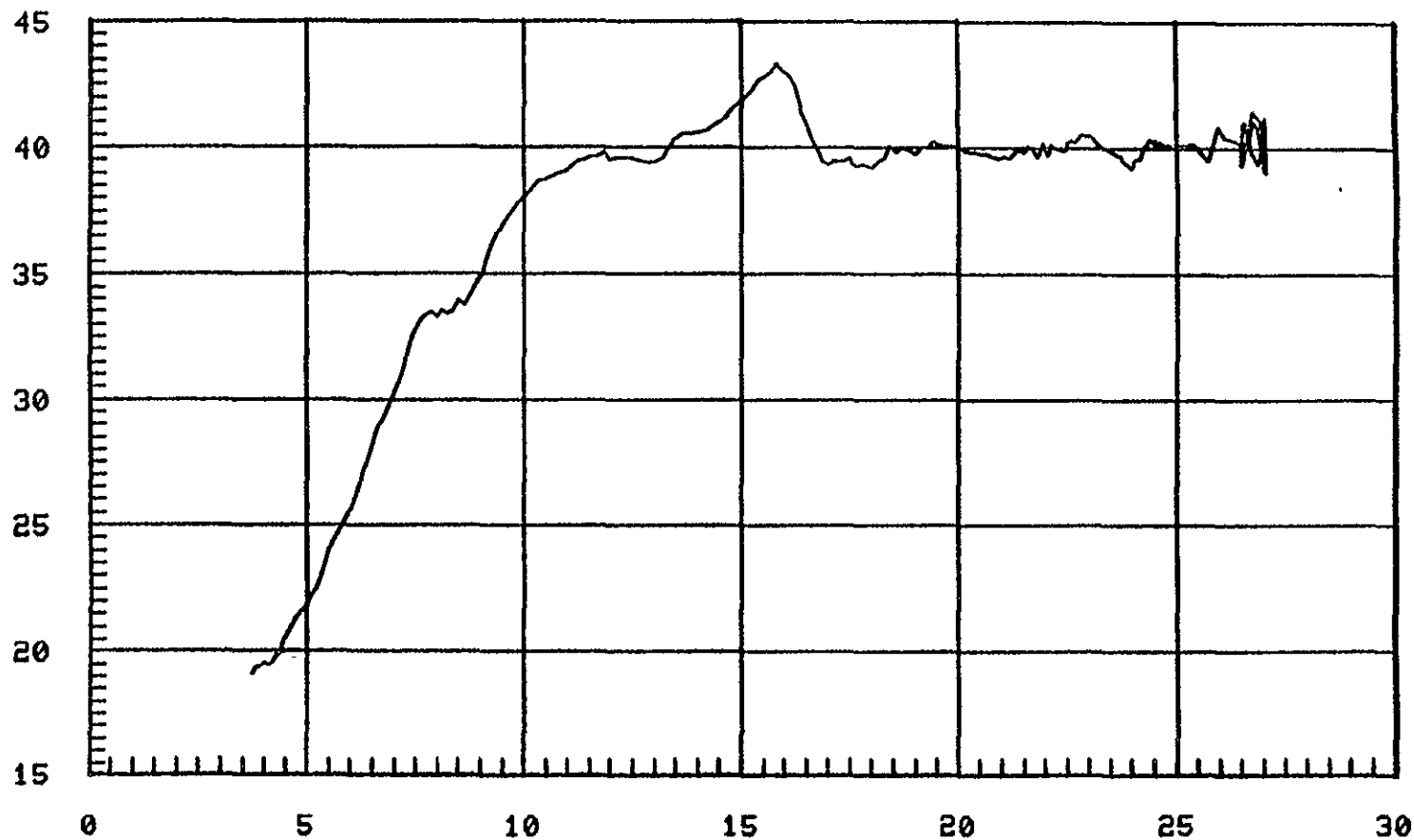
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———— STS-3

200-1380 SEC

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A-18



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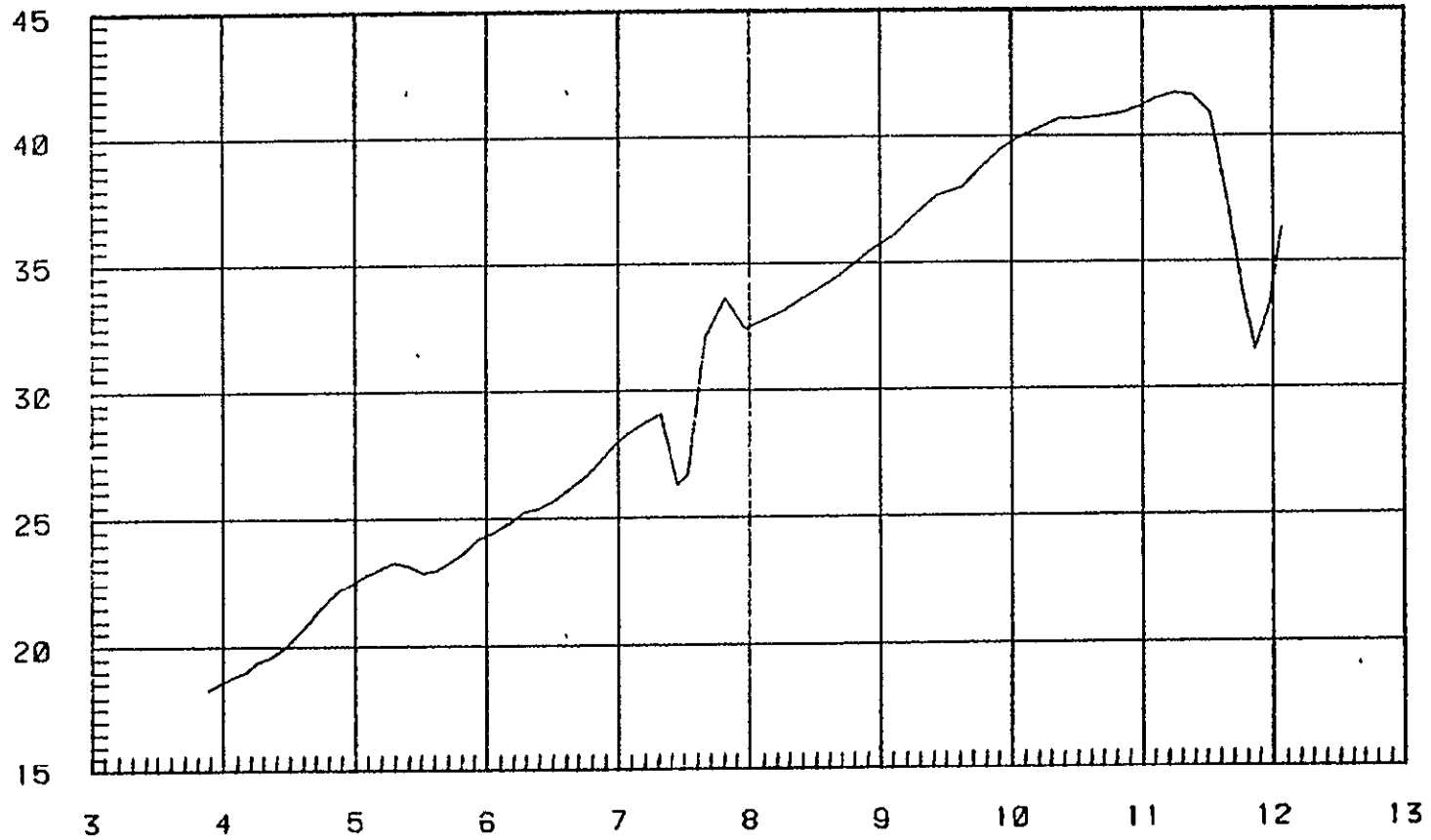
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# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

———— STS-4 965-1300 SEC

ANGLE OF ATTACK - DEG



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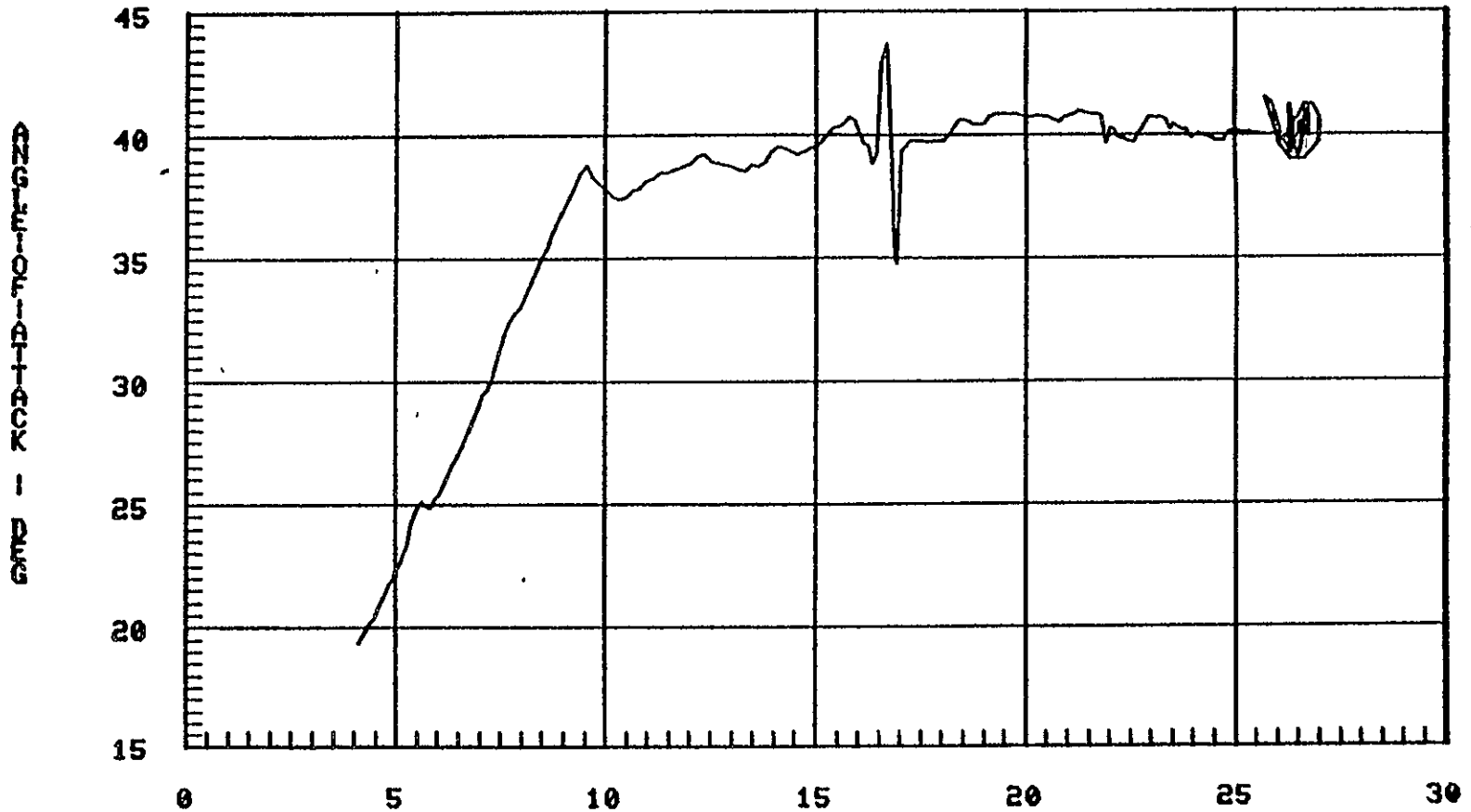
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MACH NUMBER

05/02/03  
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# STS-5 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

———— STS-5 150-1350 SEC



ACCELERATION - G

MACH NUMBER

04/28/83  
BASE TIME • 27698591.000 SEC.

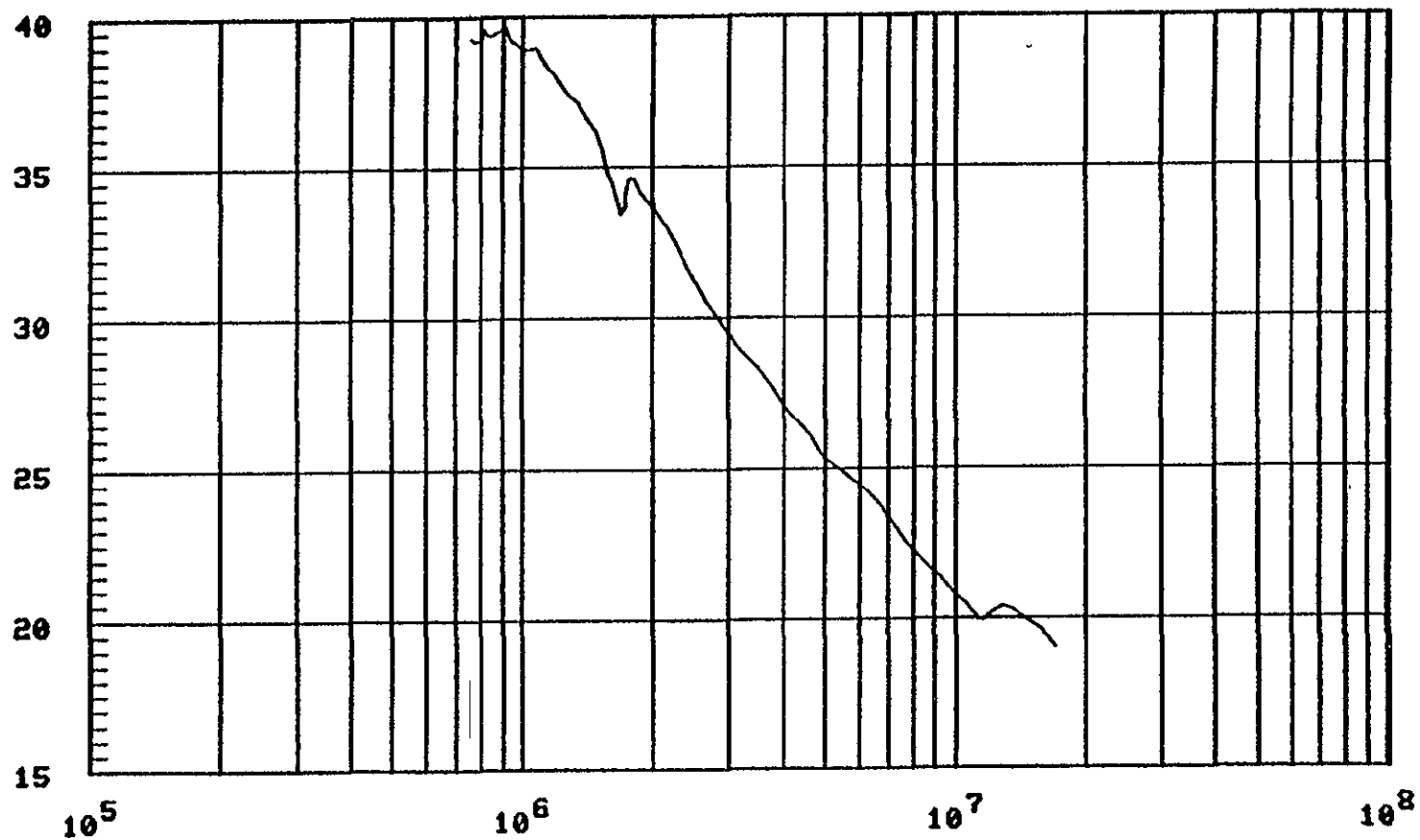
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# STS-1 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-1

1065-1460 SEC

PERFORMANCE - CUB



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REYNOLDS NUMBER (NS)

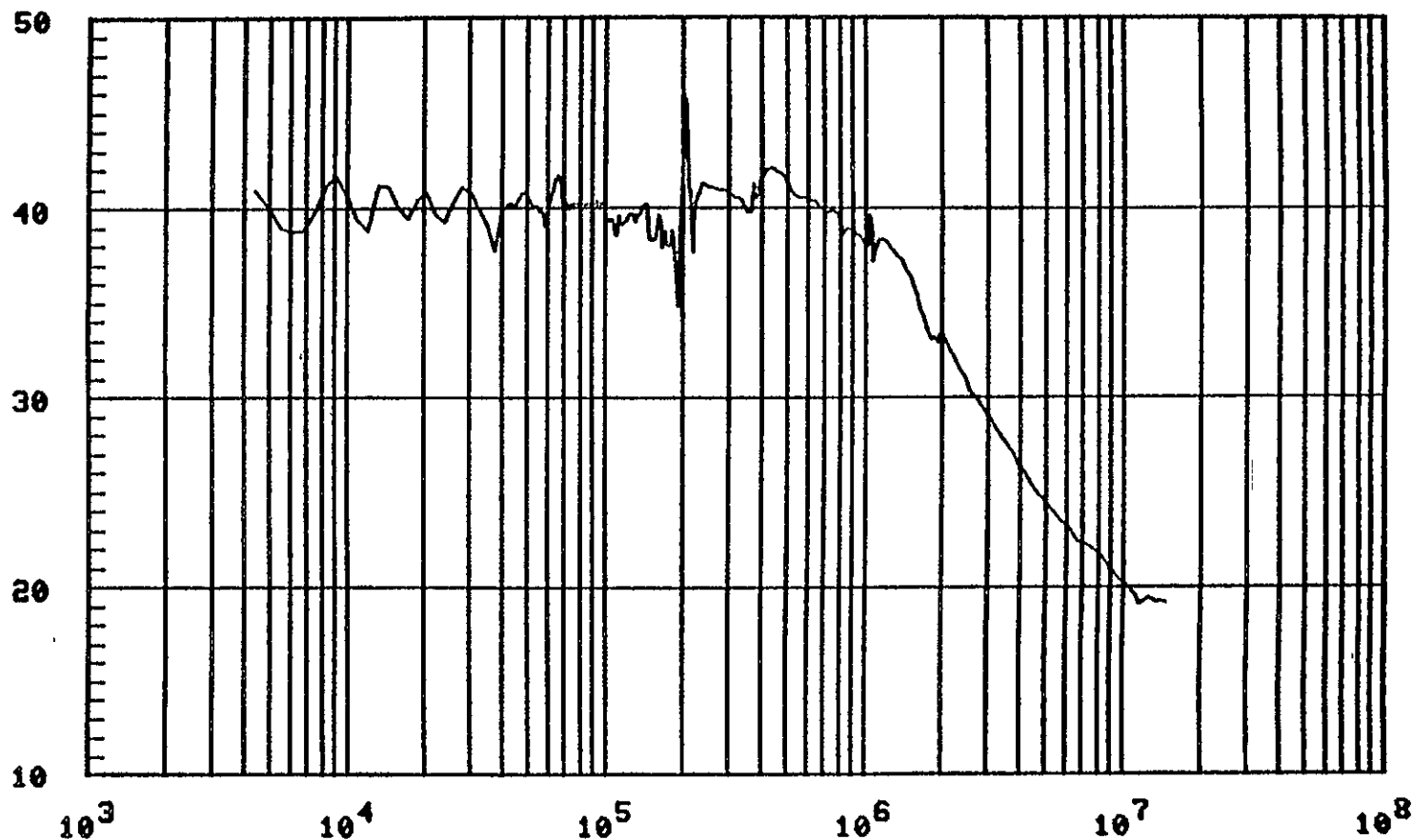
04/30/83  
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# STS-2 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-2

200-1480 SEC

CEC-M-OL-G-1-60X - RWS



REYNOLDS NUMBER (NS)

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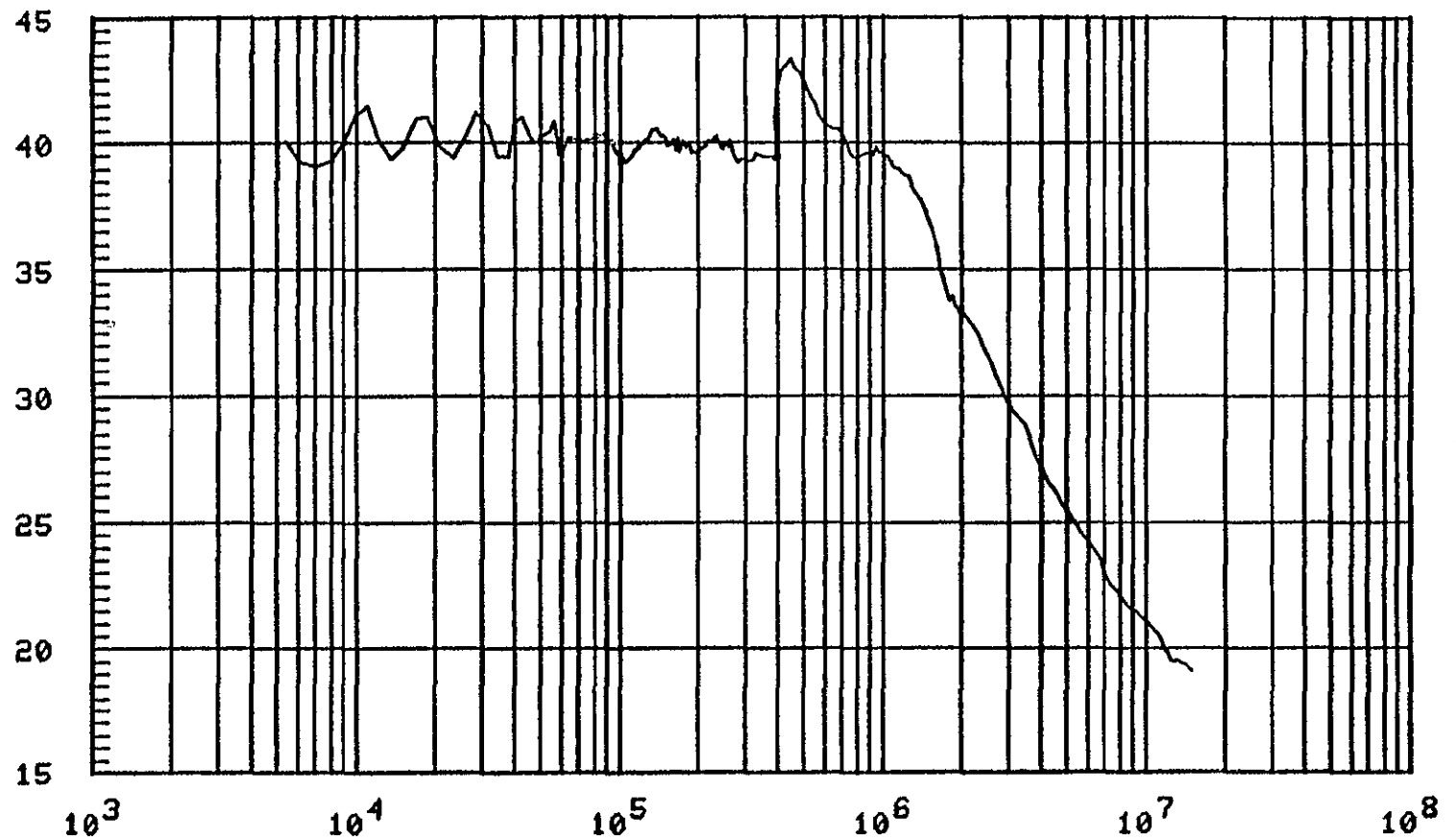
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# STS-3 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-3

200-1380 SEC



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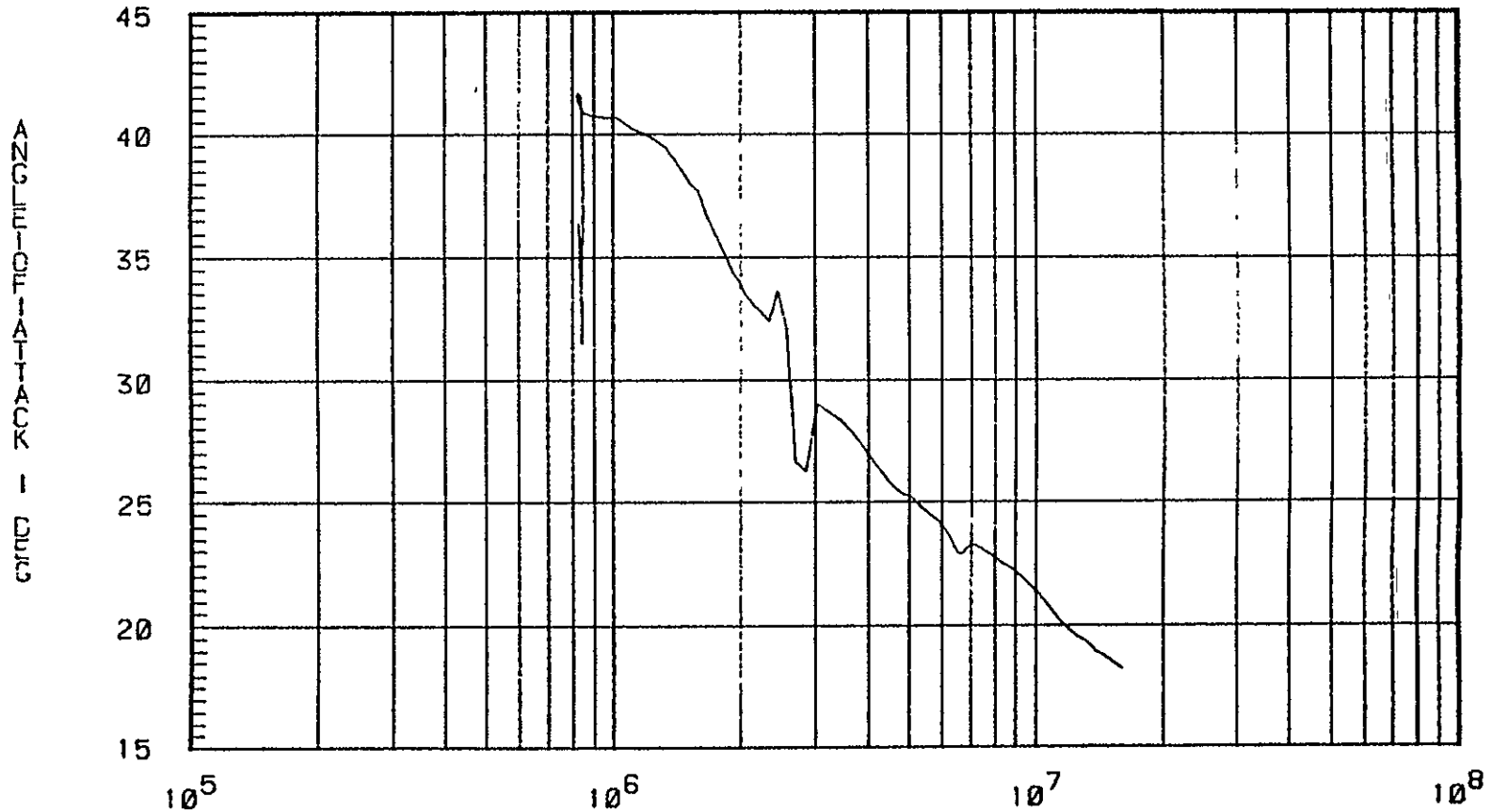
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04/30/83  
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# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

———— STS-4 065-1300 SEC



REYNOLDS NUMBER (NS)

05/02/83  
BASE TIME = 16040423.000 SEC.

A-24

ANGLE OF ATTACK - DEGS

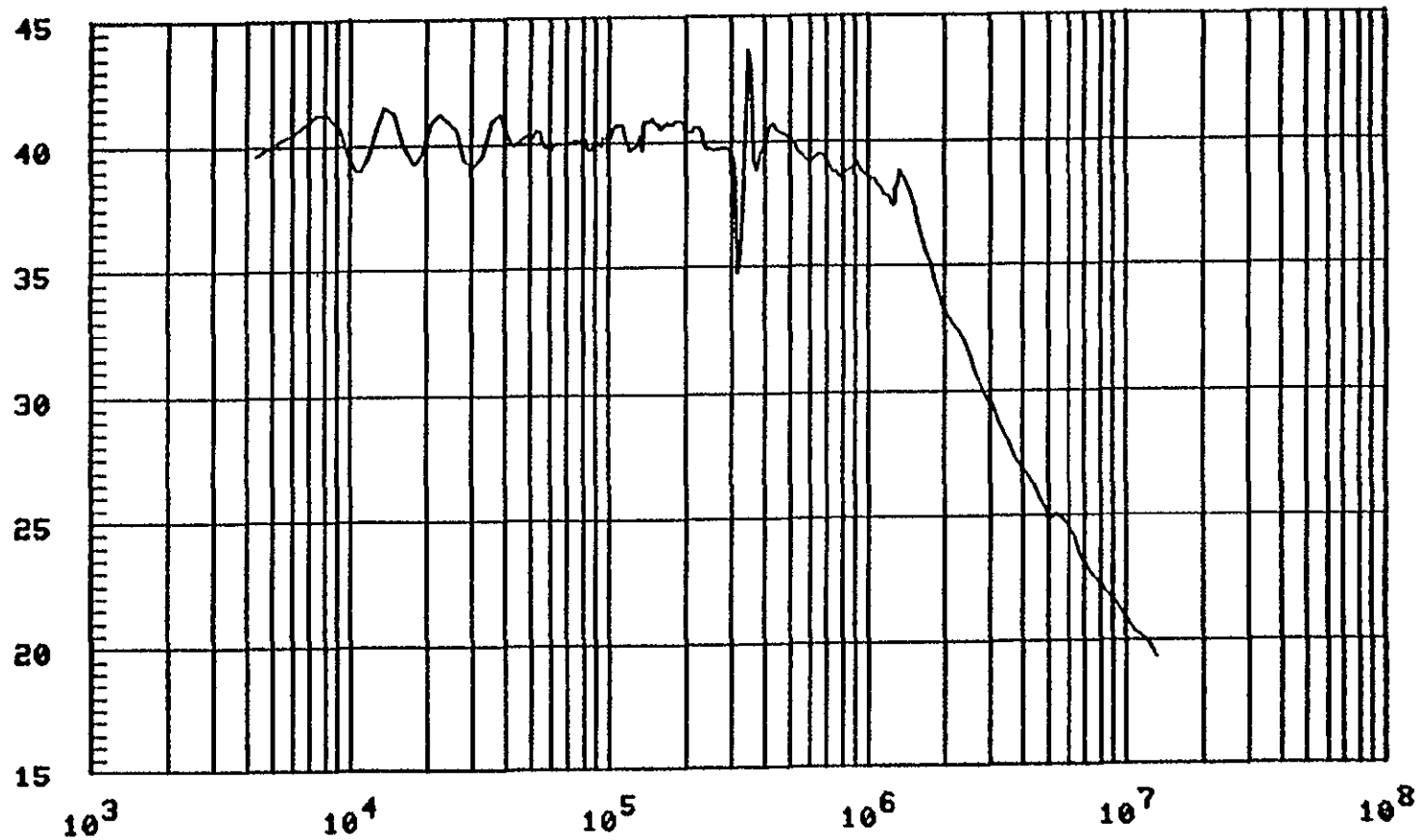
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# STS-5 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

STS-5

150-1350 SEC

REYNOLDS NUMBER (NS)



REYNOLDS NUMBER (NS)

04/28/83

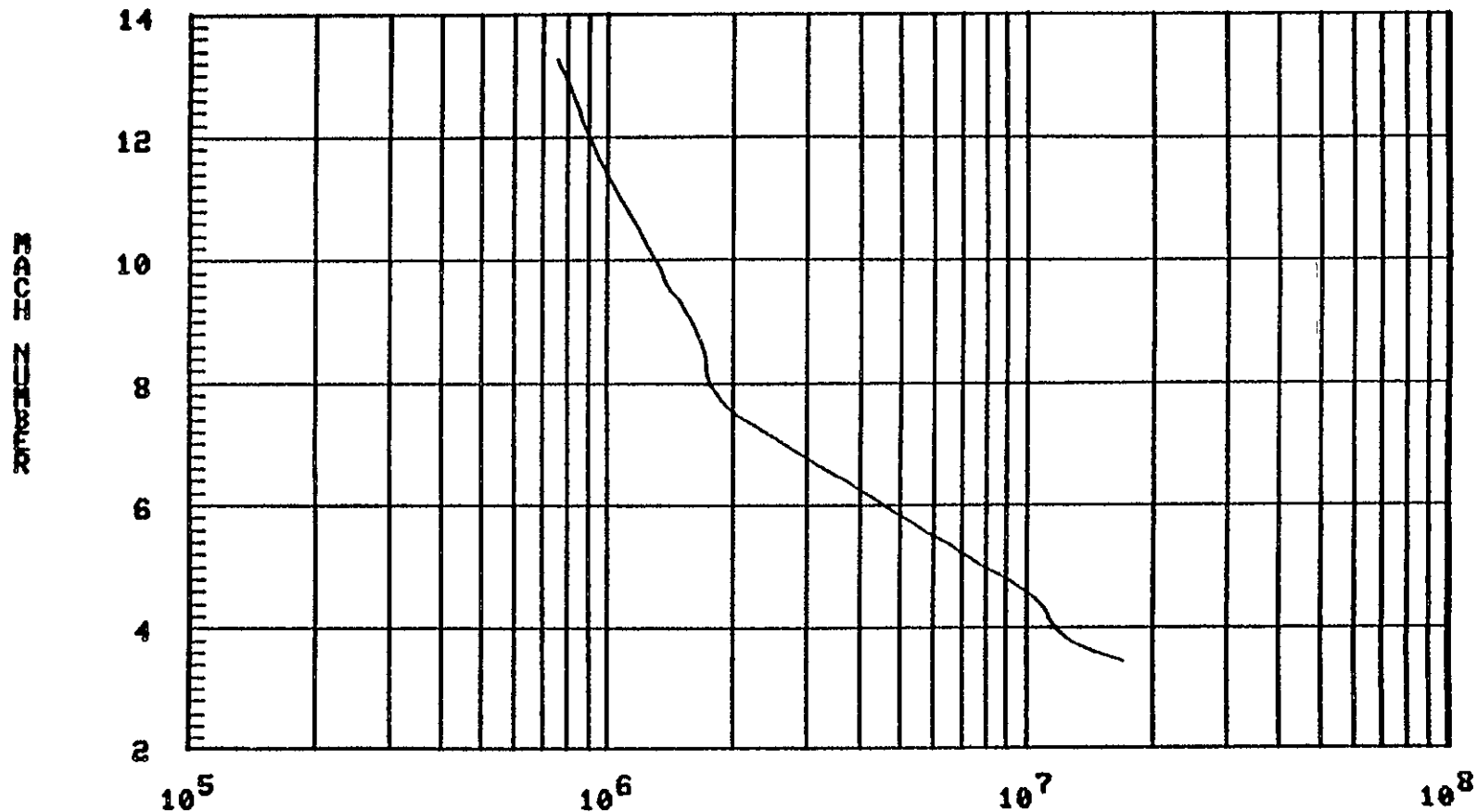
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STS-1

1065-1460 SEC



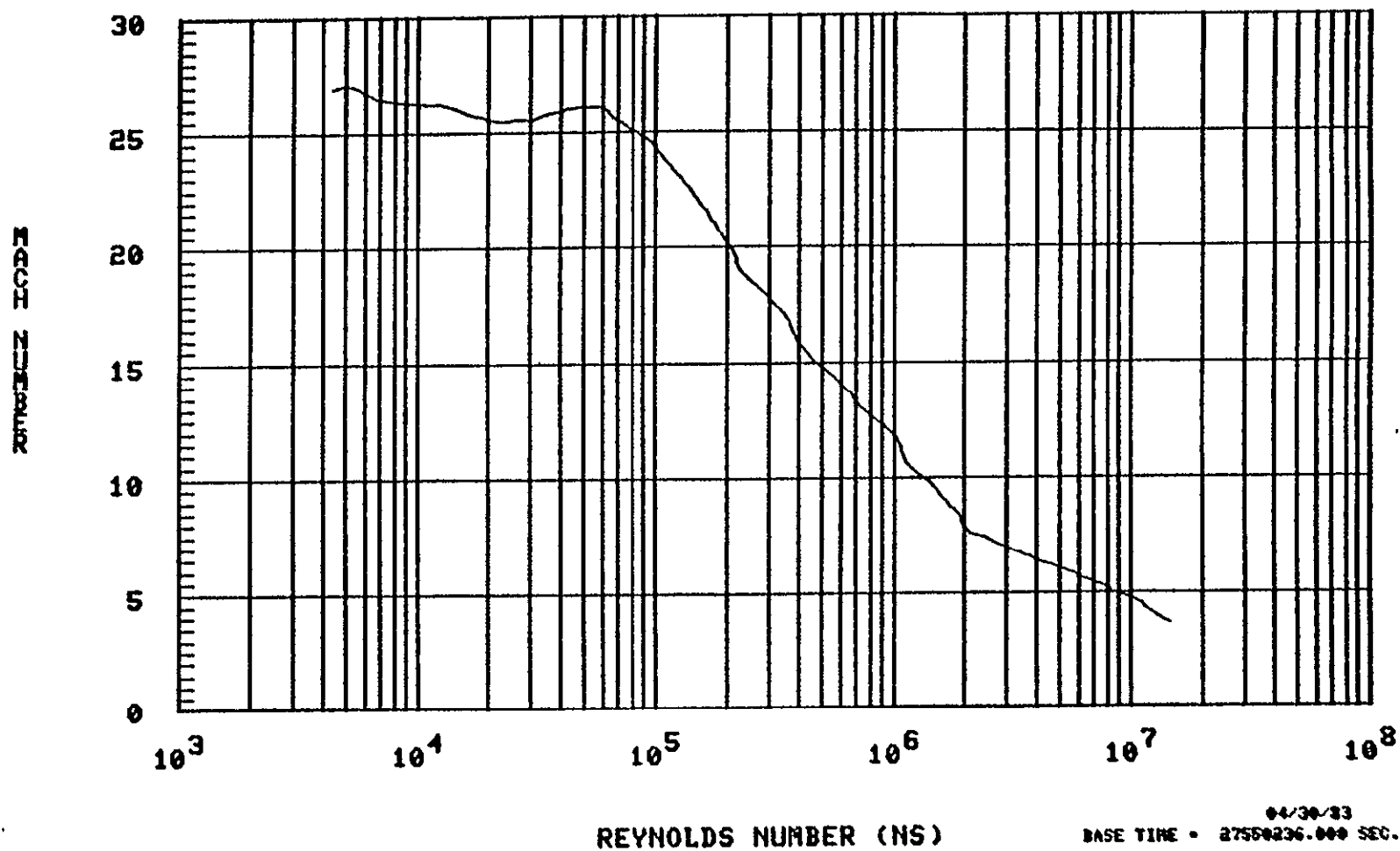
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———— STS-2

200-1480 SEC

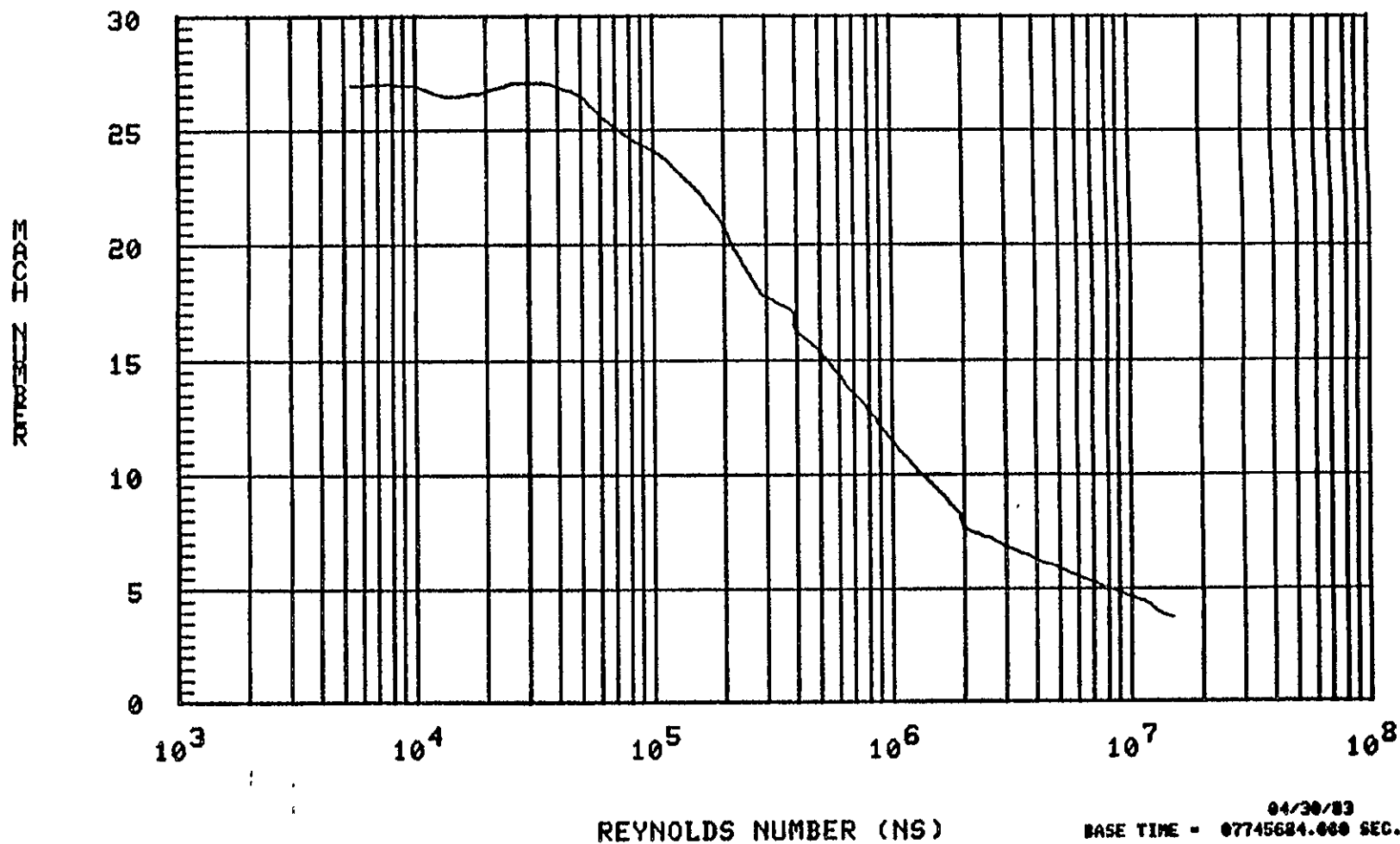


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———— STS-3

200-1380 SEC

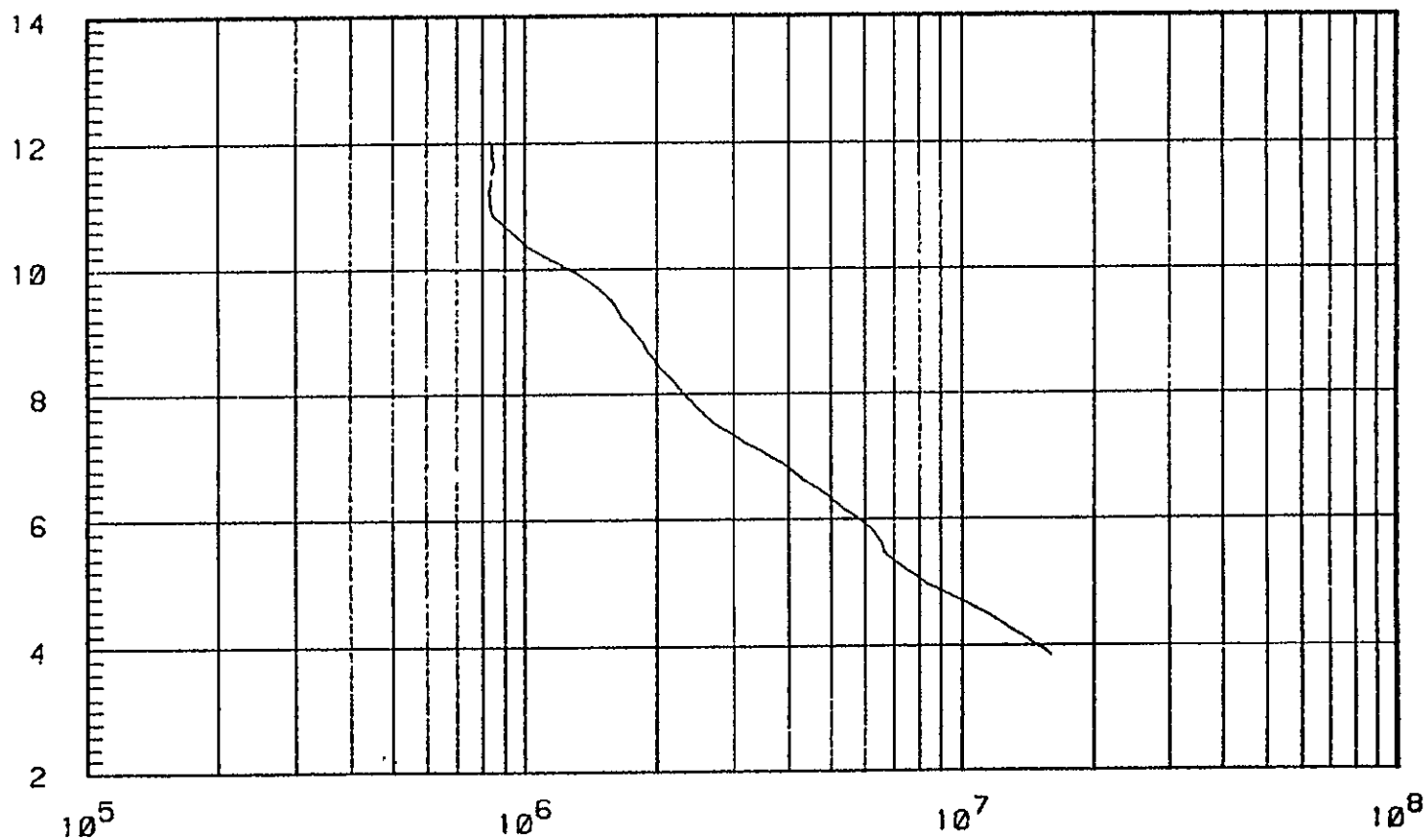


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———— STS-4 065-1300 SEC



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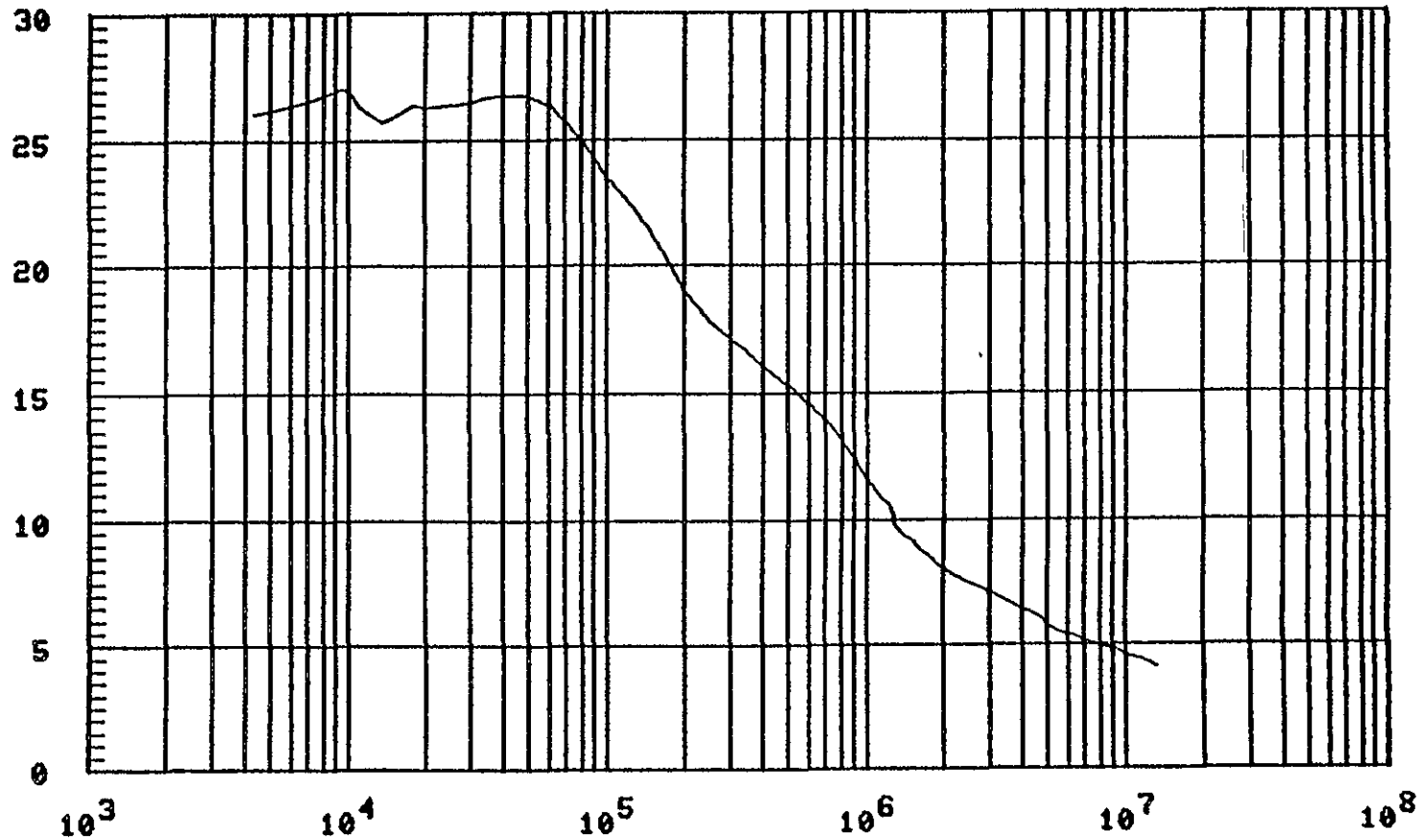
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STS-5

150-1350 SEC



REYNOLDS NUMBER (NS)

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A-30

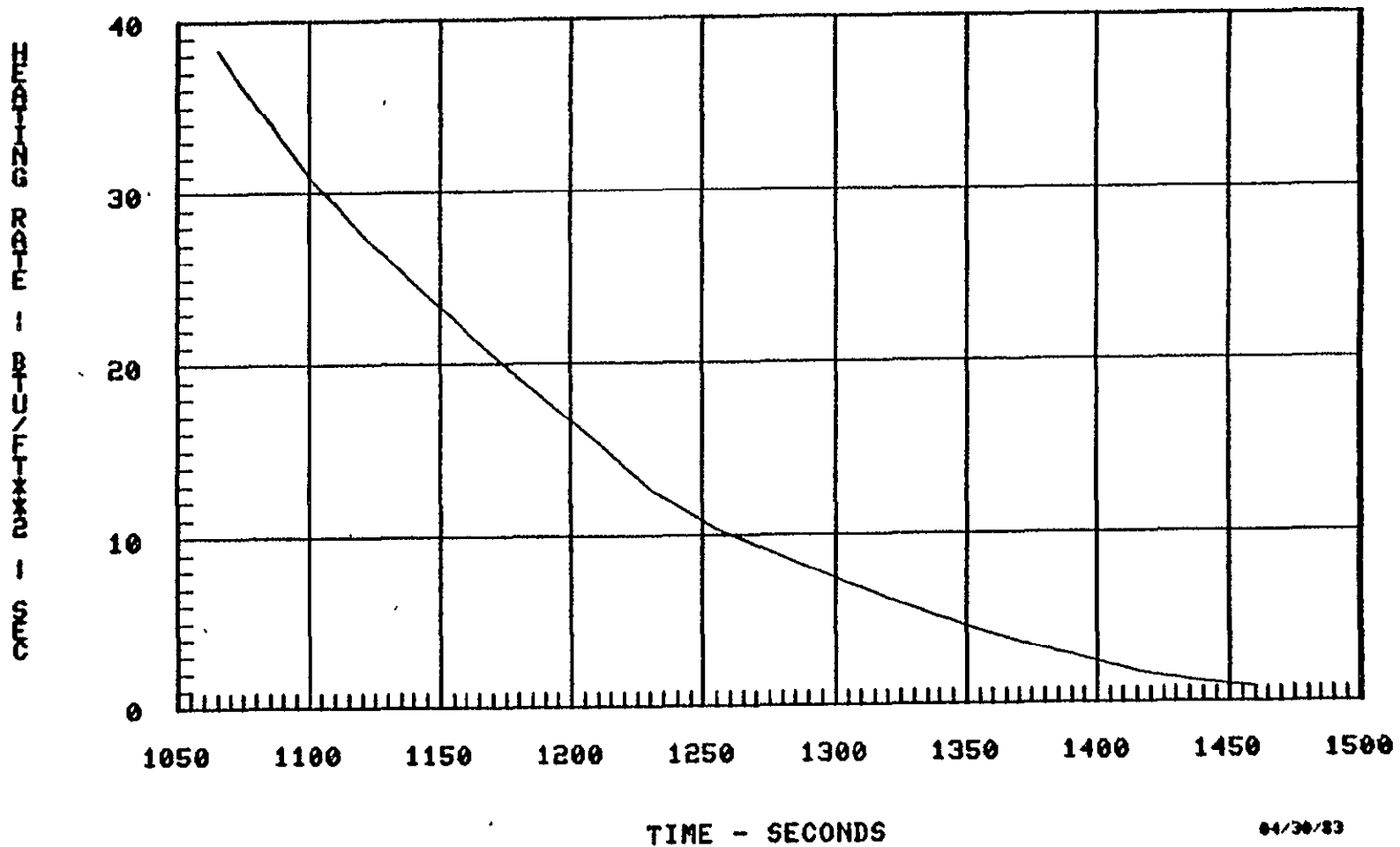
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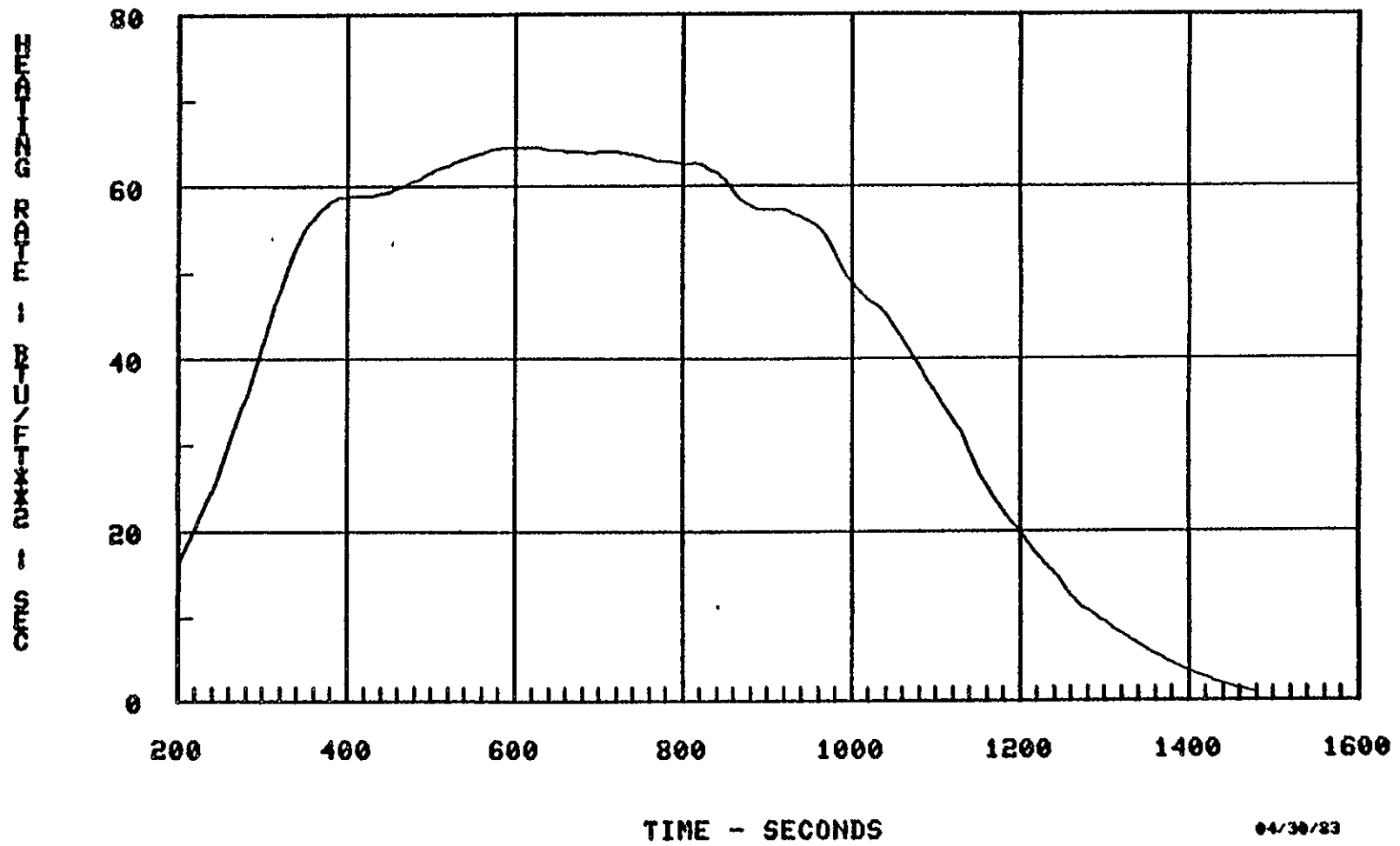
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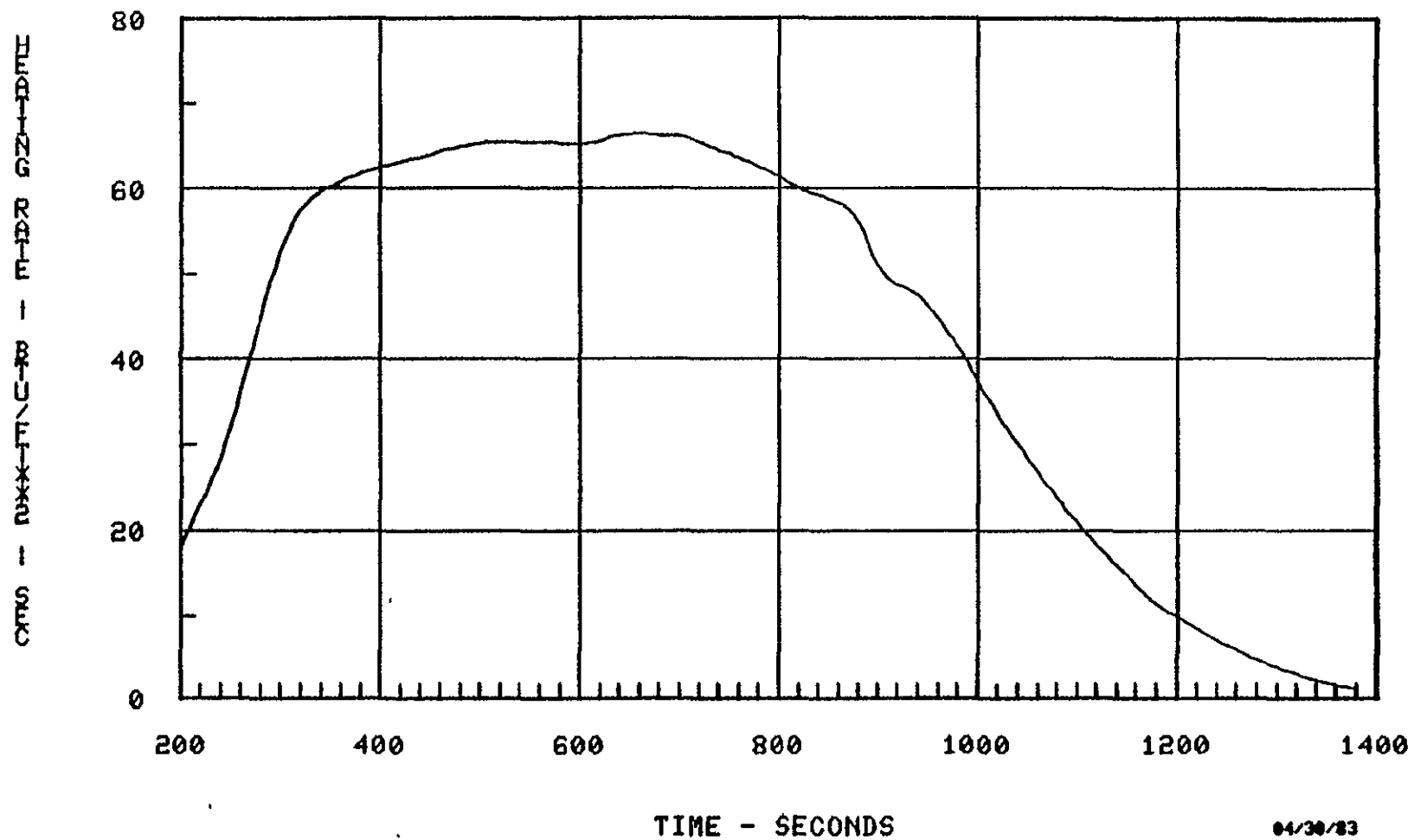
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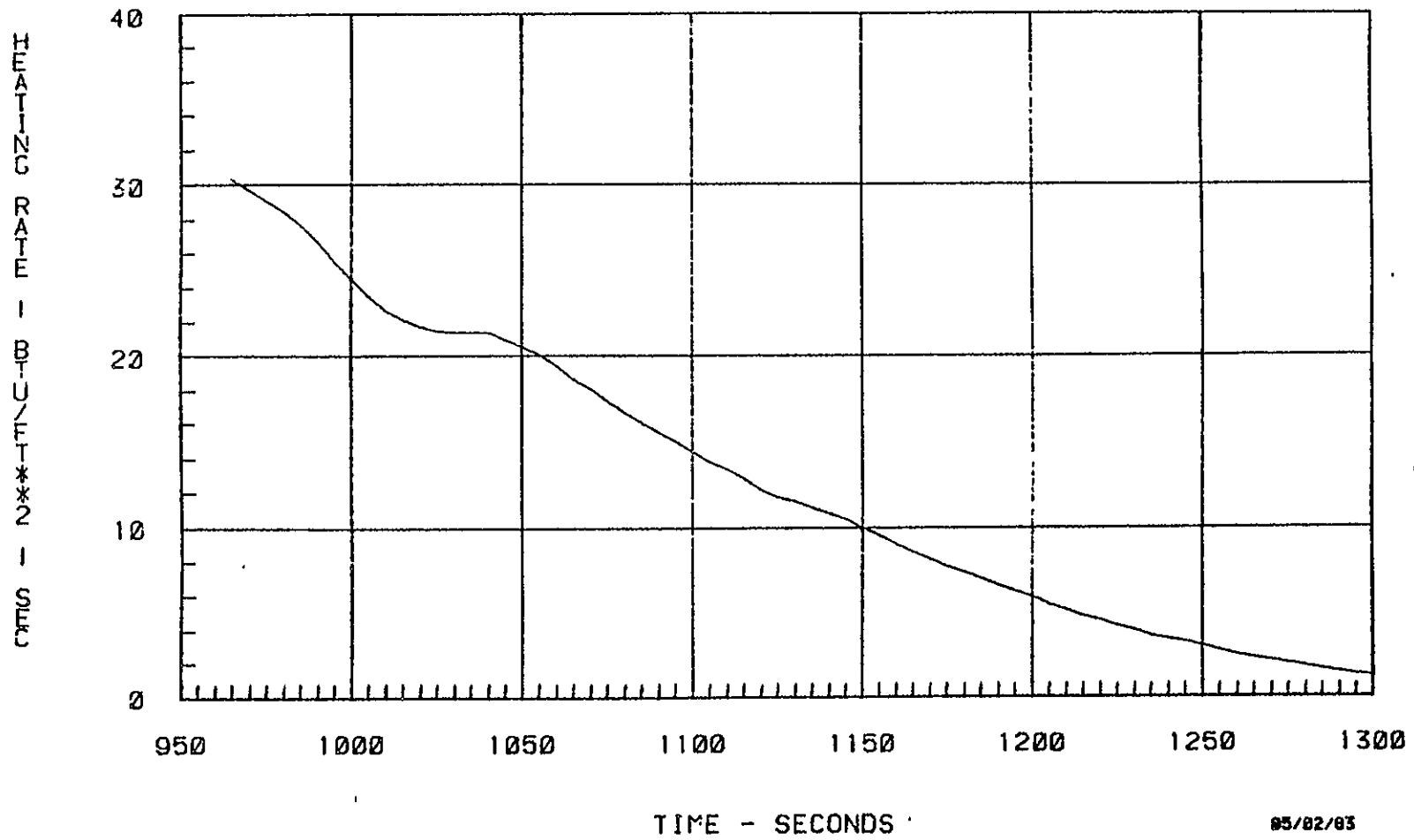
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— OREF

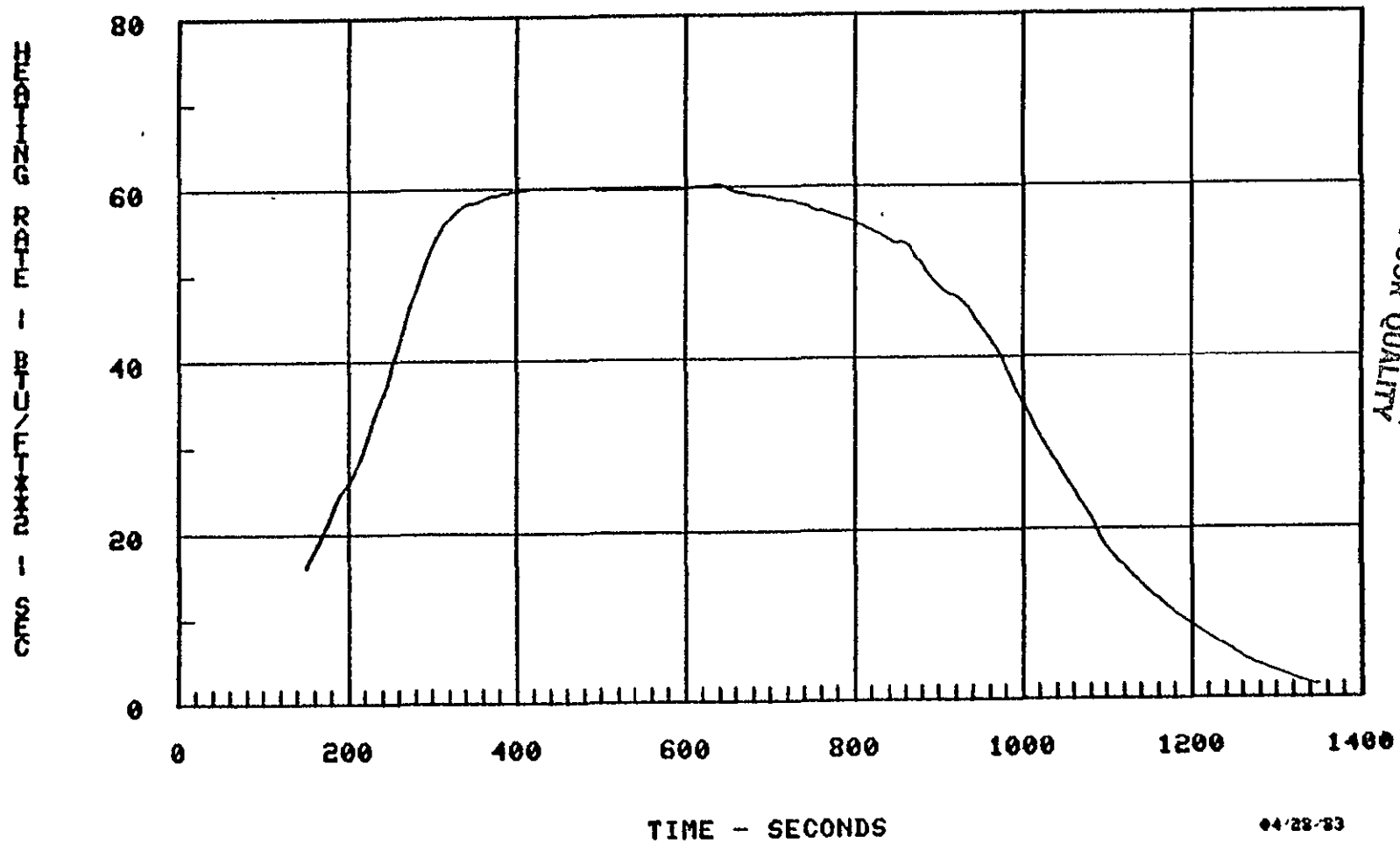


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95/02/03

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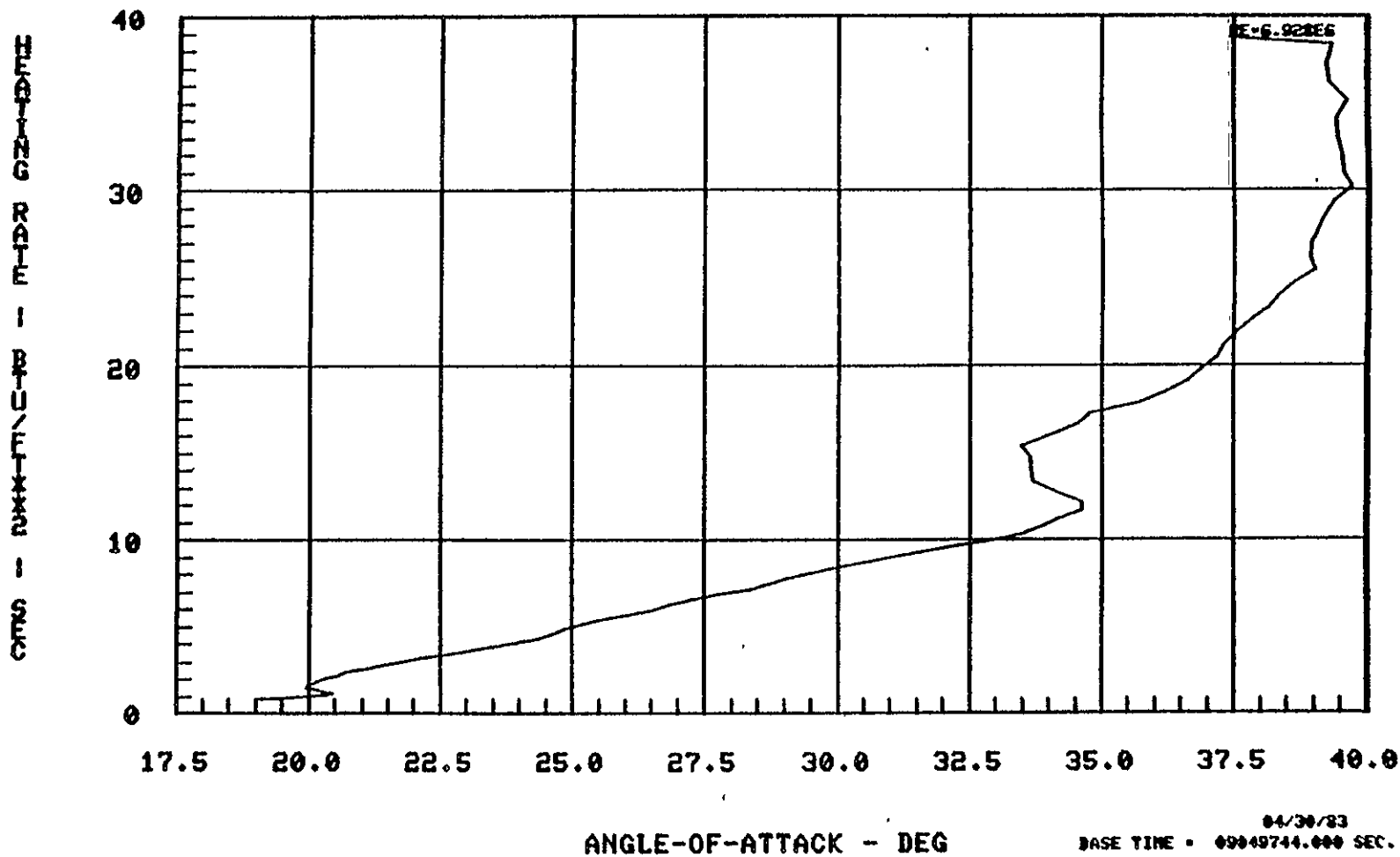
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QREF

1065-1460 SEC

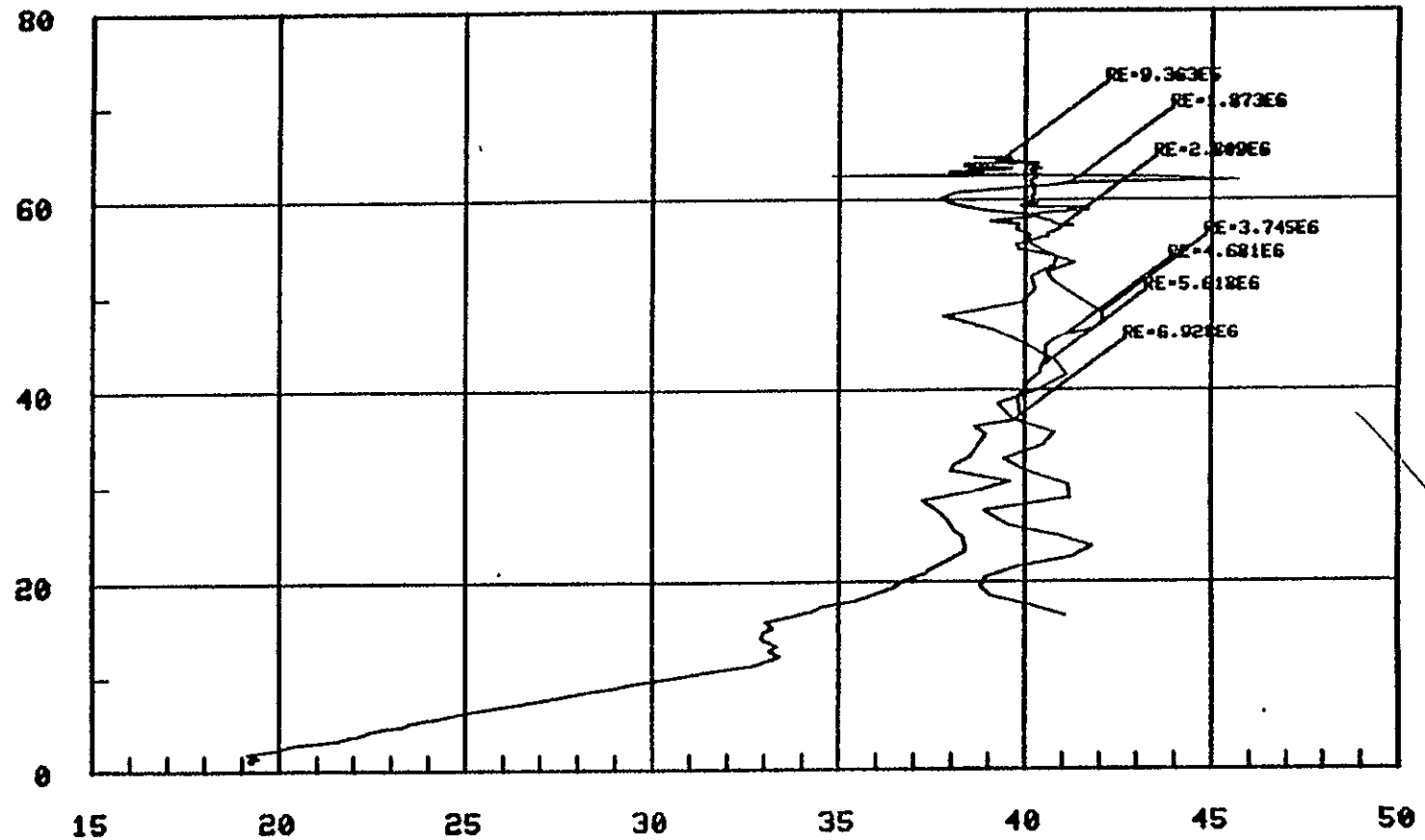


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QREF

200-1480 SEC

HEIGHTS REF - 100 FT - 200 FT - 300 FT



ANGLE-OF-ATTACK - DEG

04/30/83  
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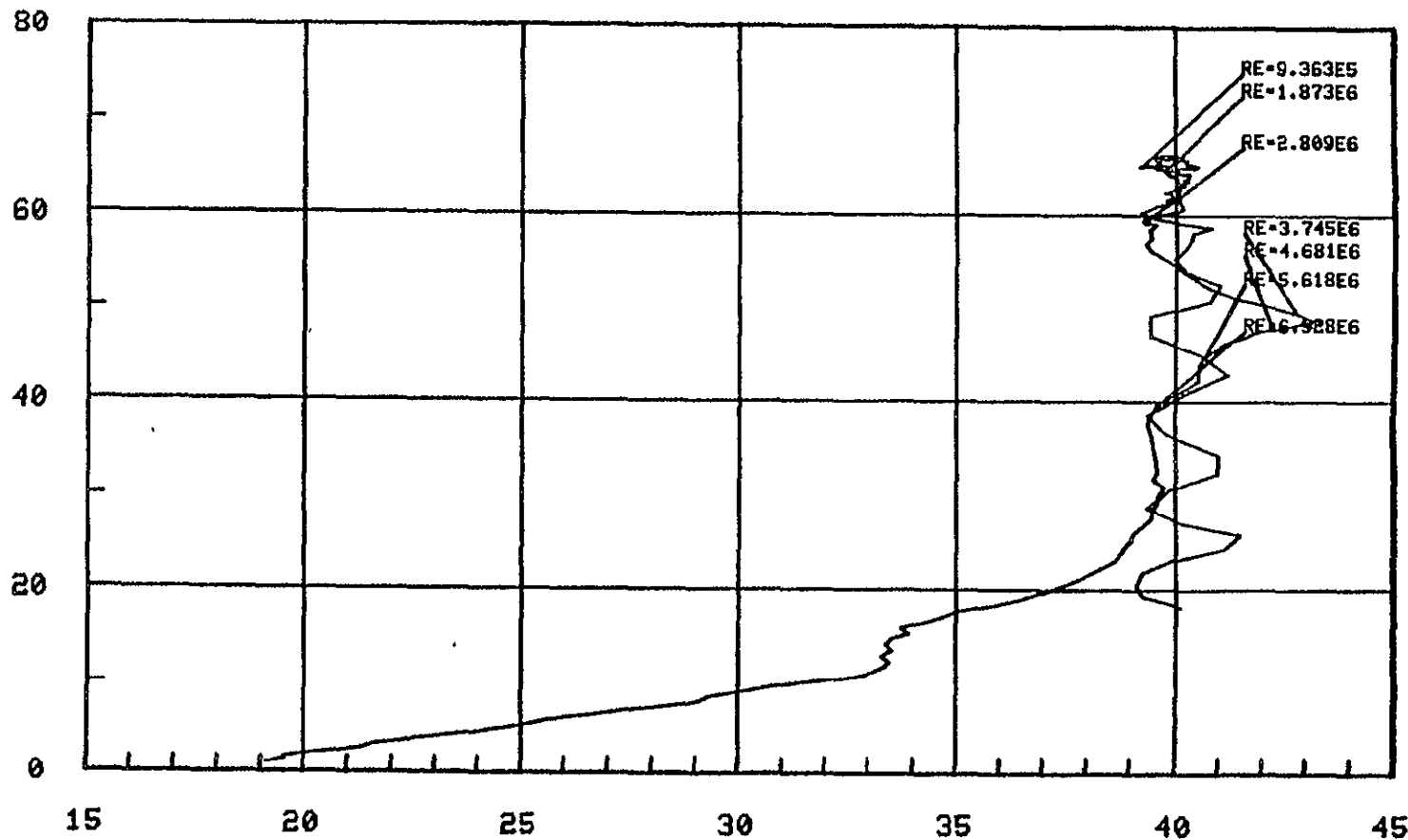
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— GREF

200-1380 SEC

LOADING RATE - ROLLING - SHOCK



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ANGLE-OF-ATTACK - DEG

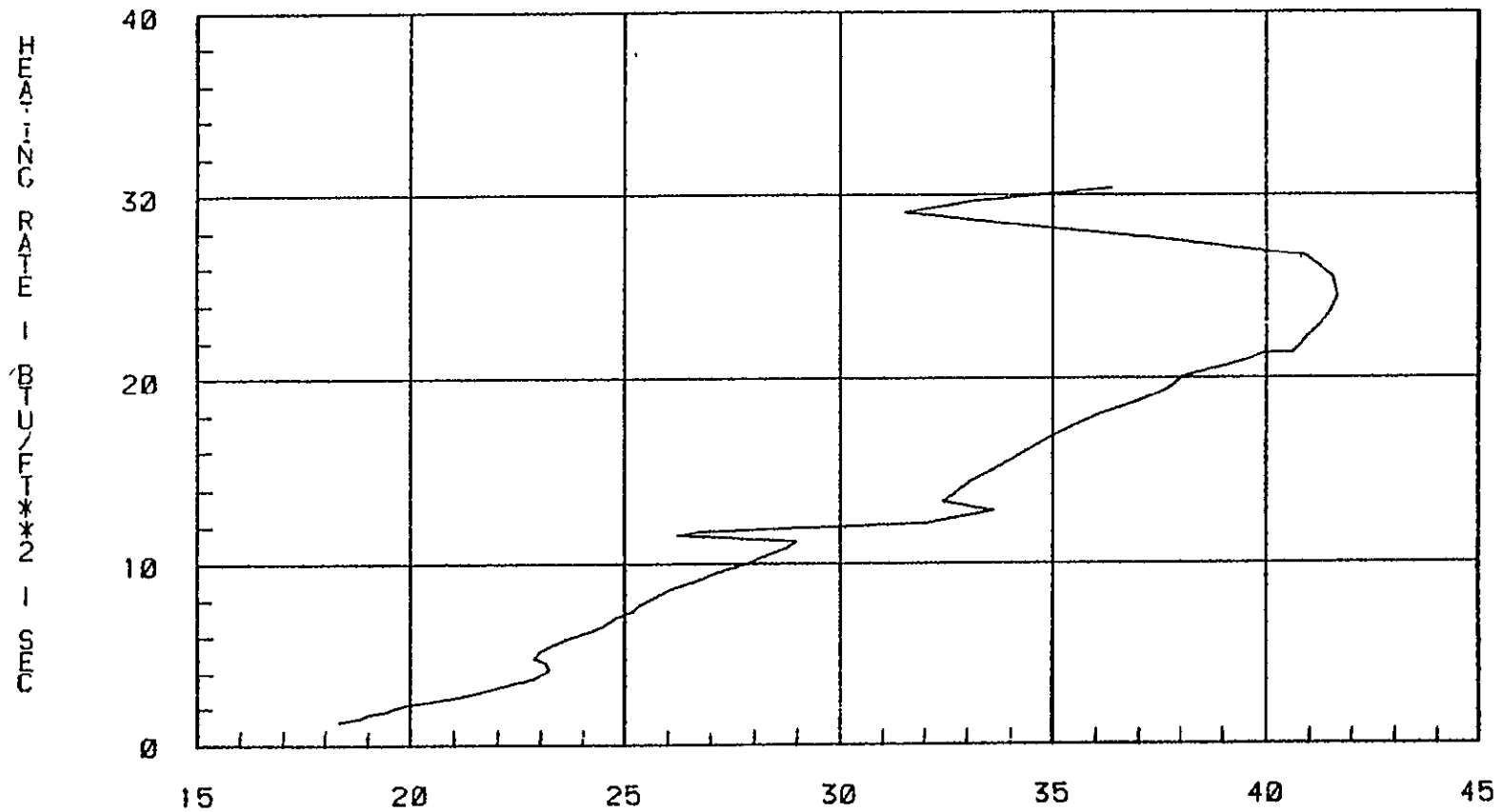
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— QREF

965-1300 SEC



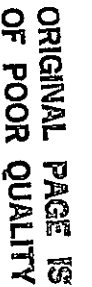
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ANGLE-OF-ATTACK - DEG

05/02/83  
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**150-1350 SEC**

\*\*\*\*\*BUREAU RATE\*\*\*\*\*



04/28/83

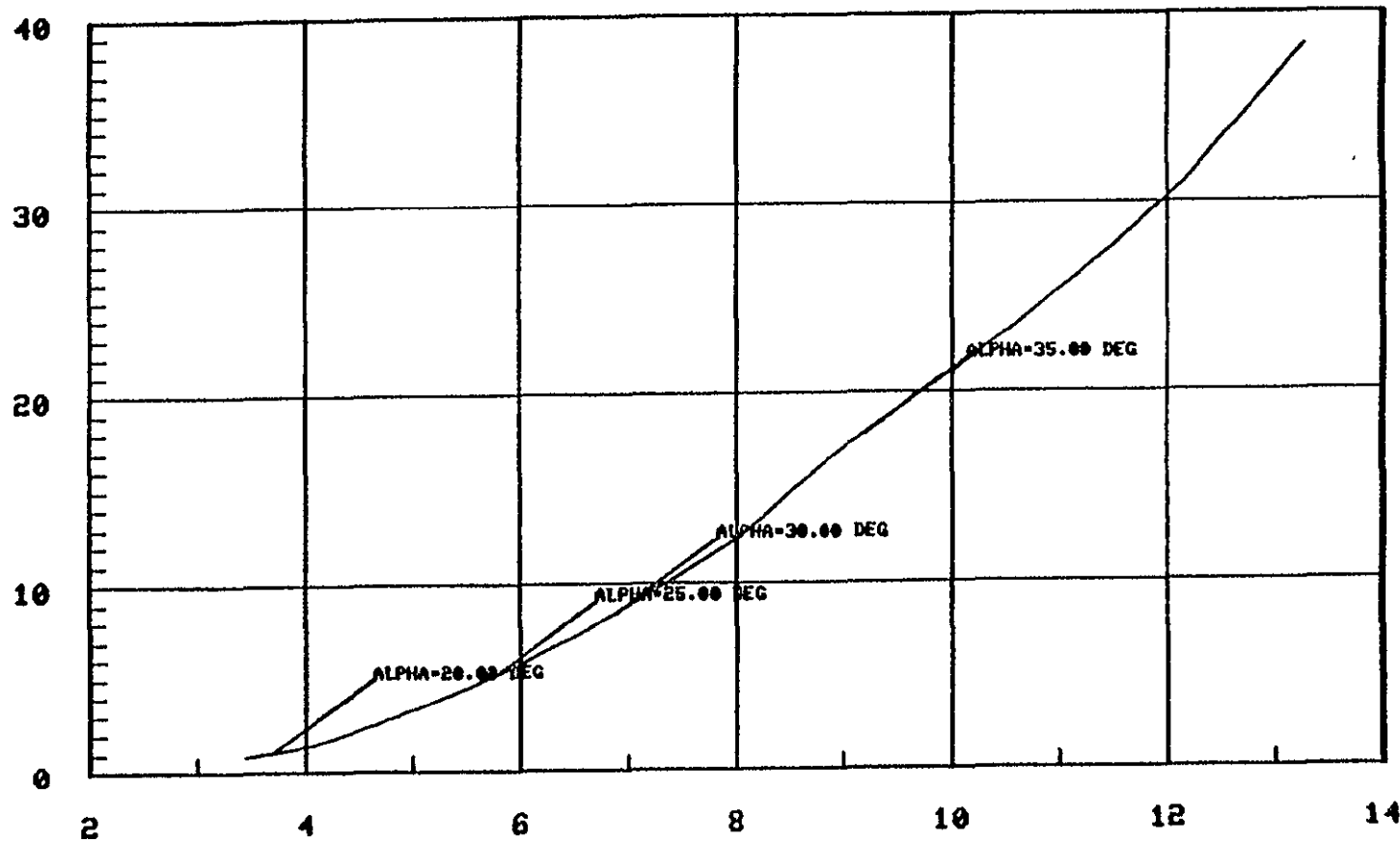
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FLIGHTING RATE - BTU/FT-HRS - SUC



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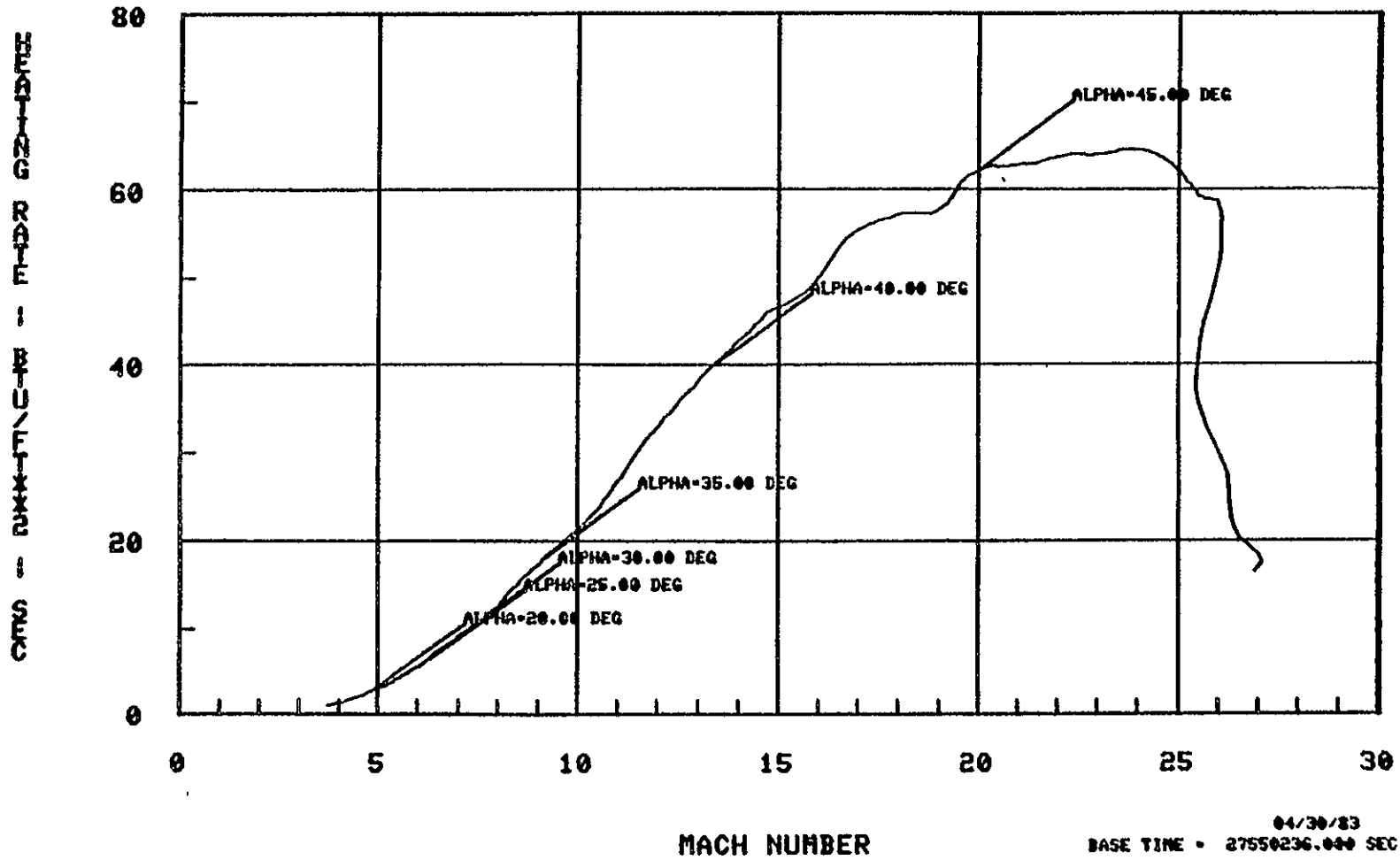
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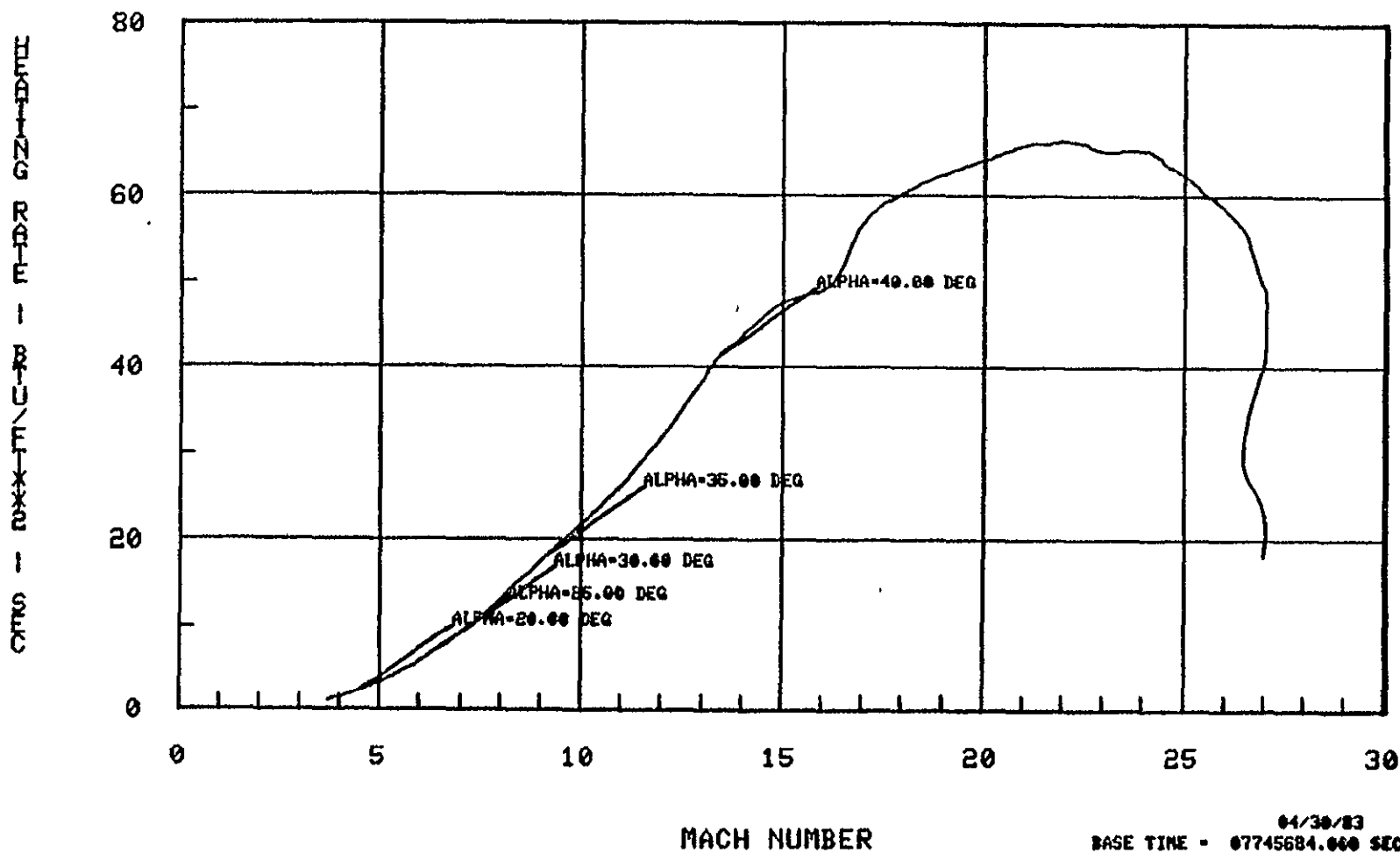


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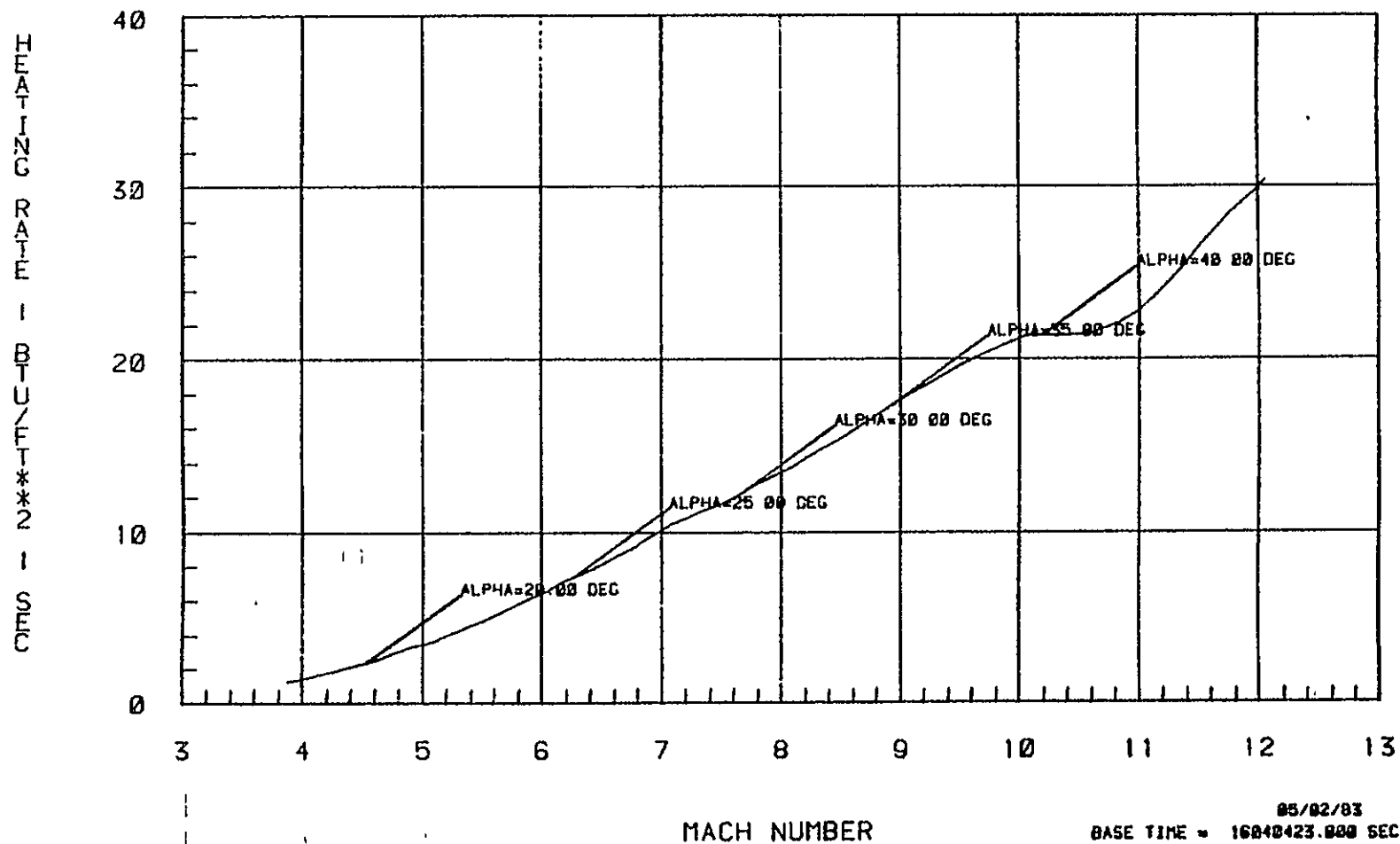
200-1380 SEC



# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

ORF

965-1300 SEC



A-44

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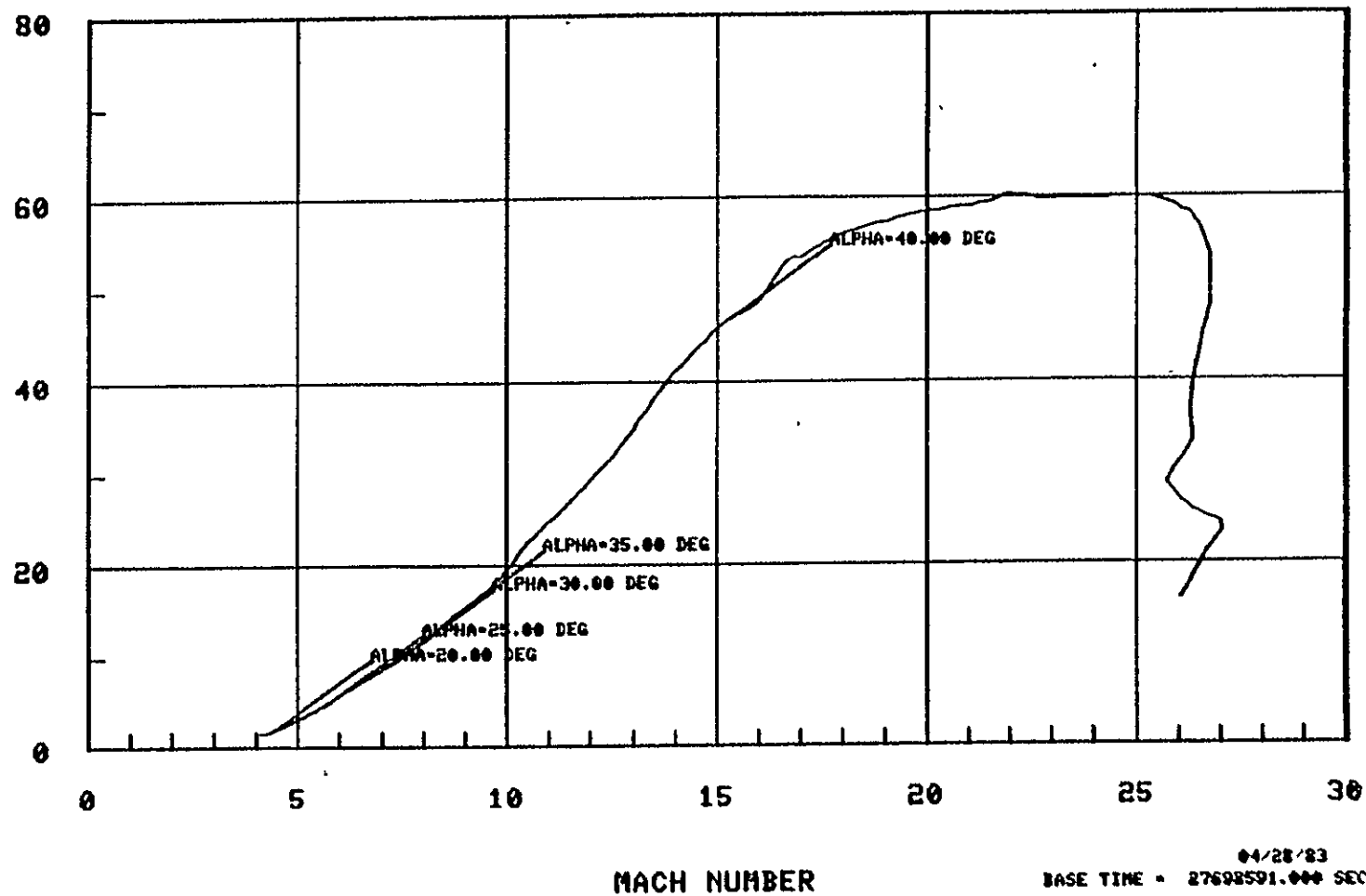
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150-1350 SEC

FLIGHT REF - 20-00-00-000 - 0000

A-45

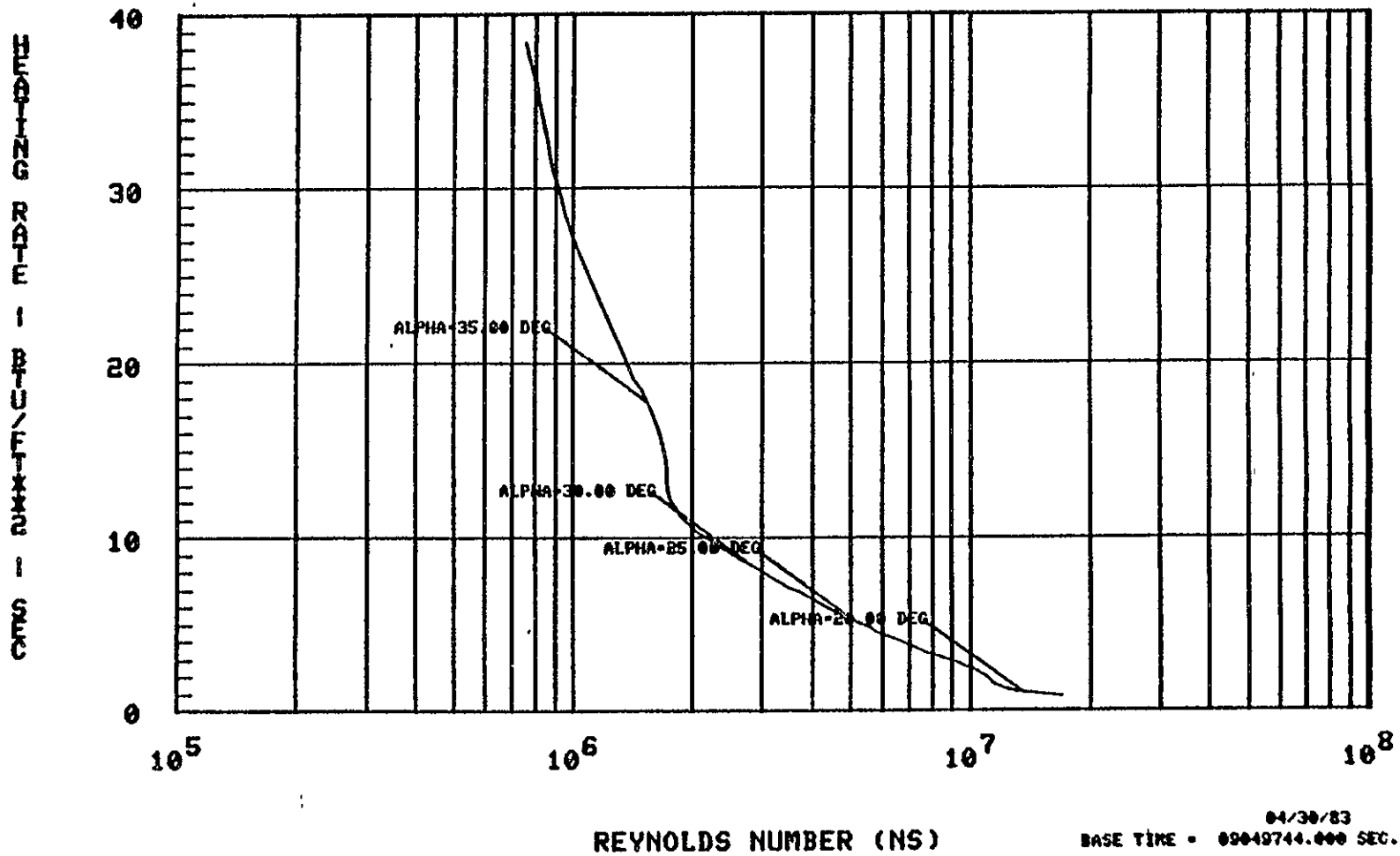


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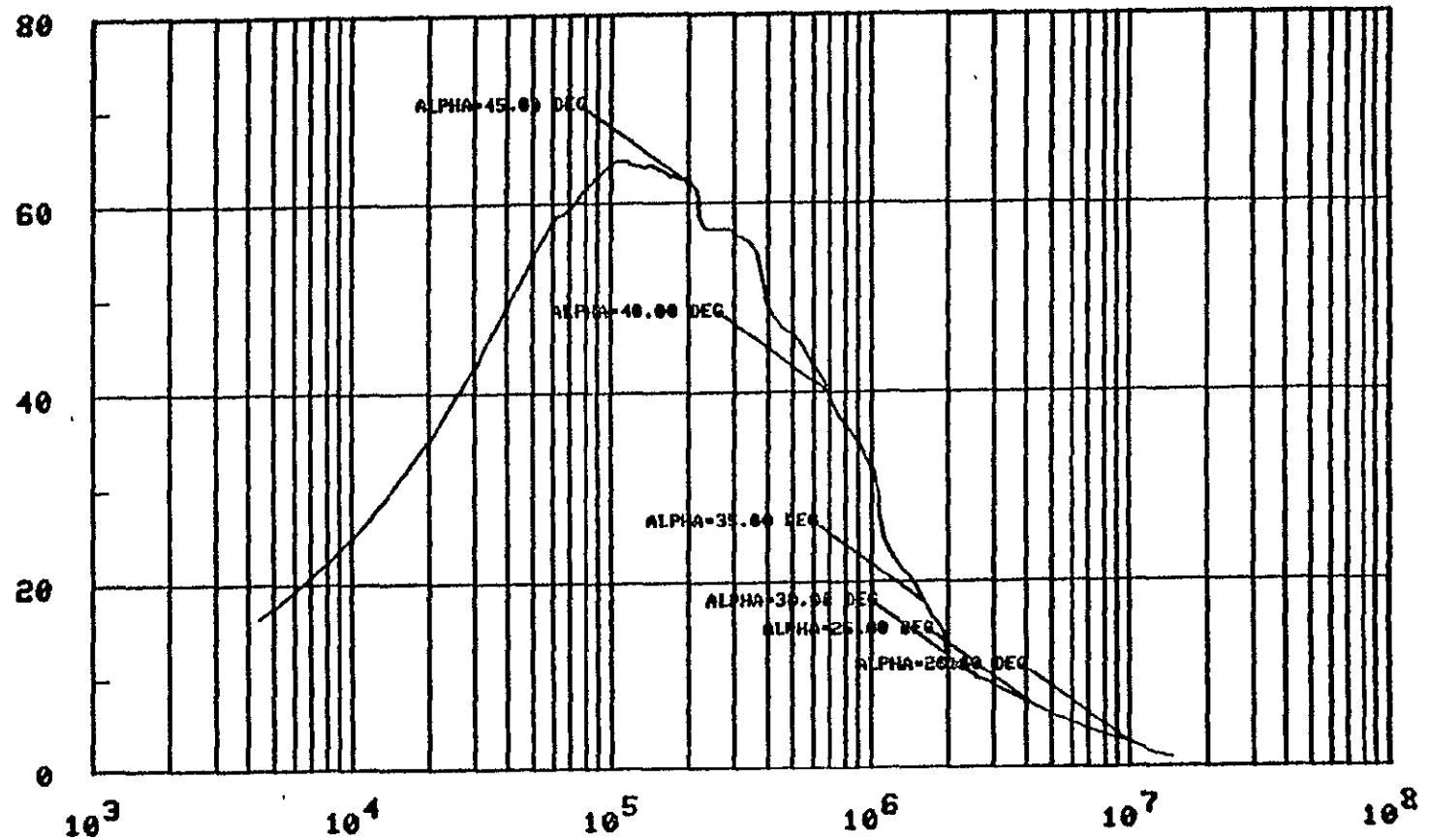


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QREF

200-1480 SEC

INTEGRATED QREF - 200-1480 SEC



REYNOLDS NUMBER (NS)

04/30/83

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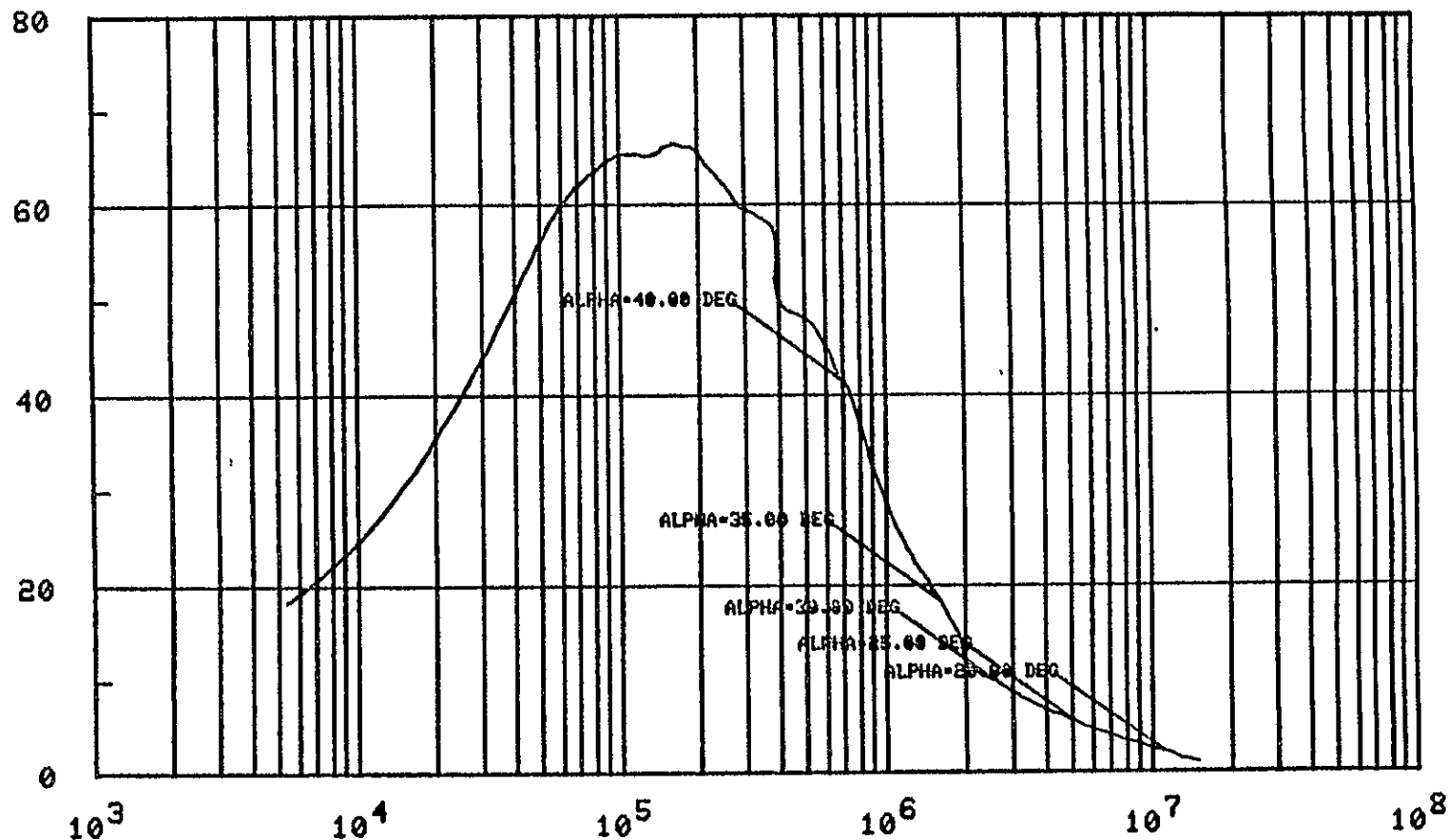
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200-1380 SEC

INVERTING RDR-W - R-D\LT-XKN - SMC

A-48



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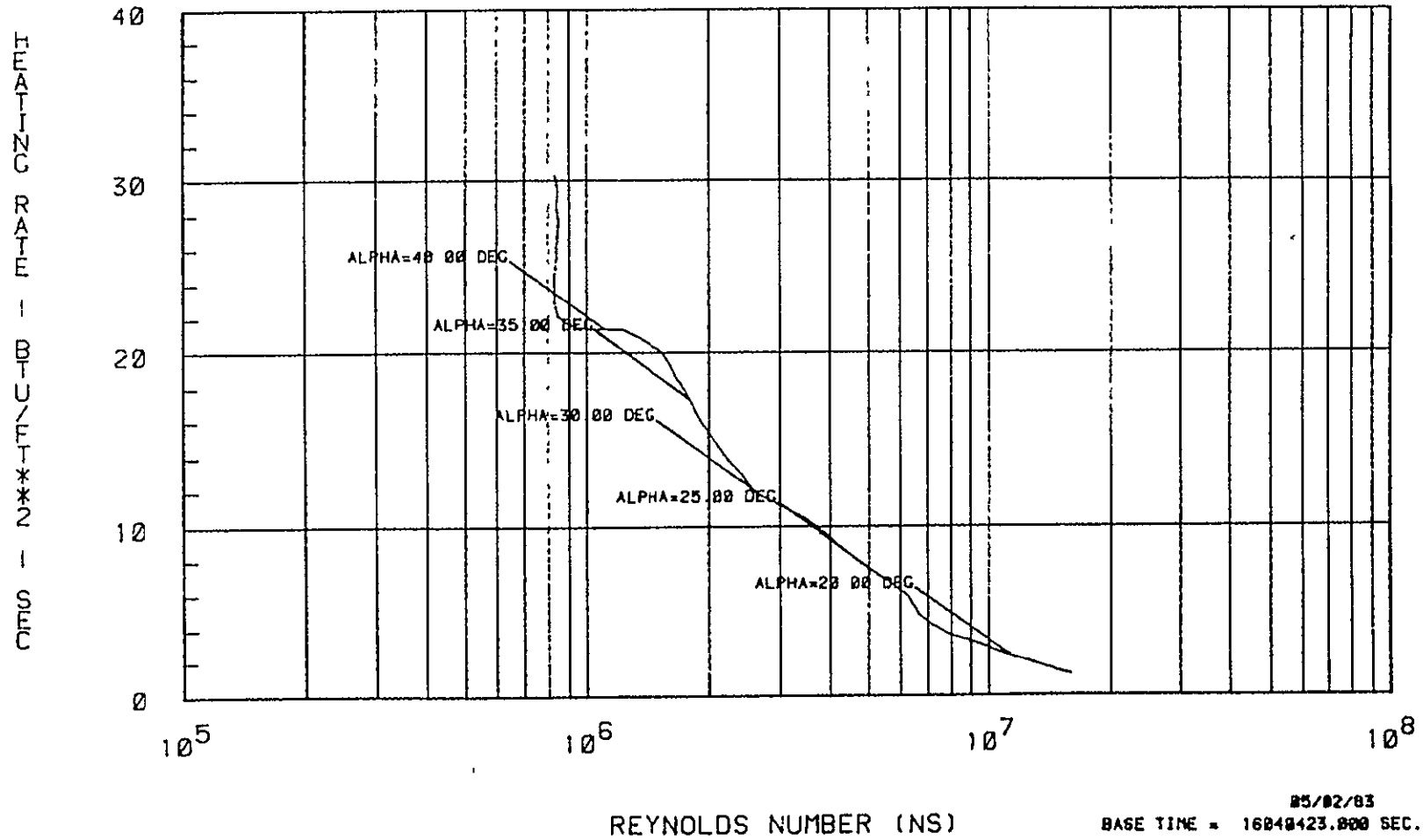
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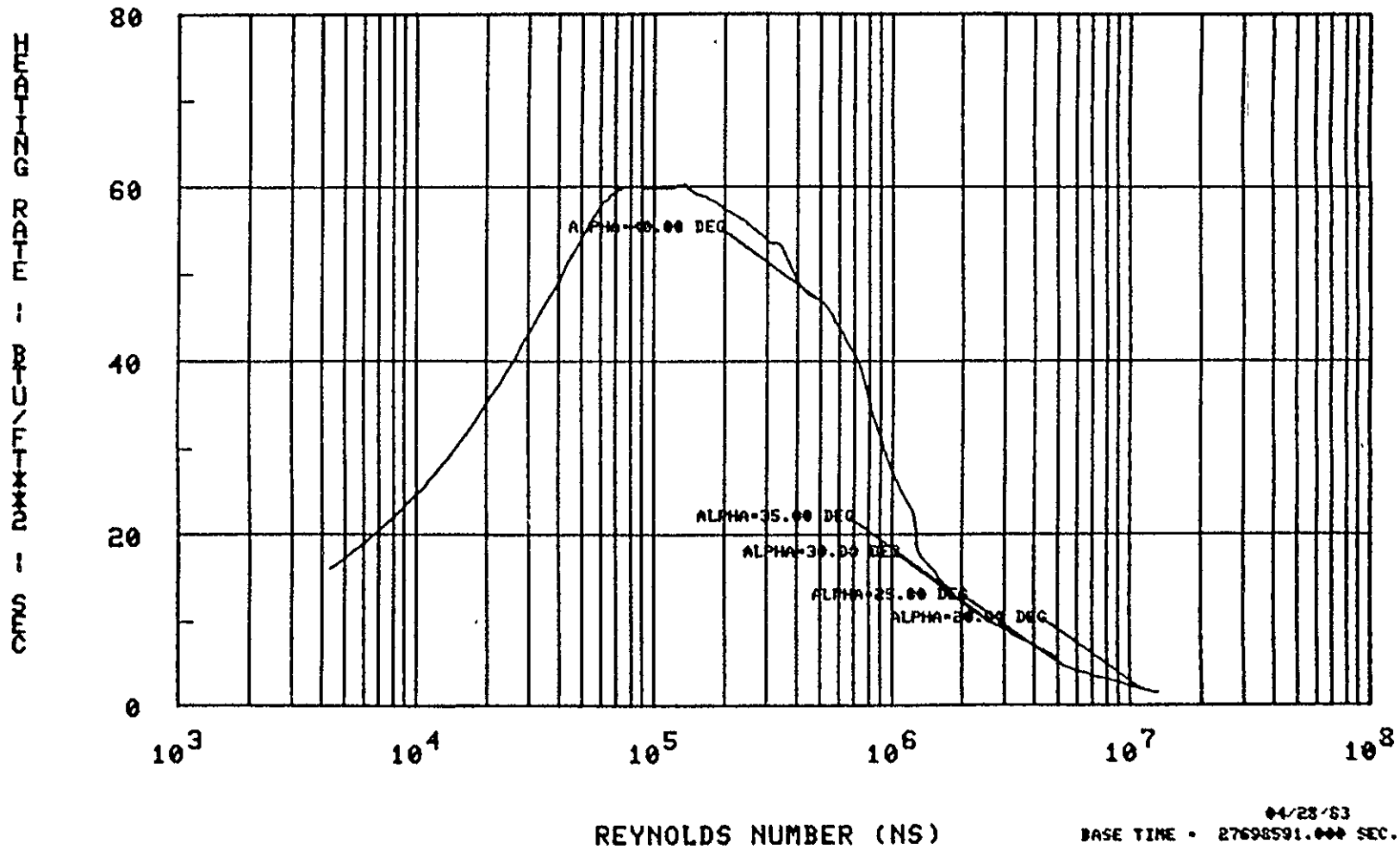


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QREF

150-1350 SEC

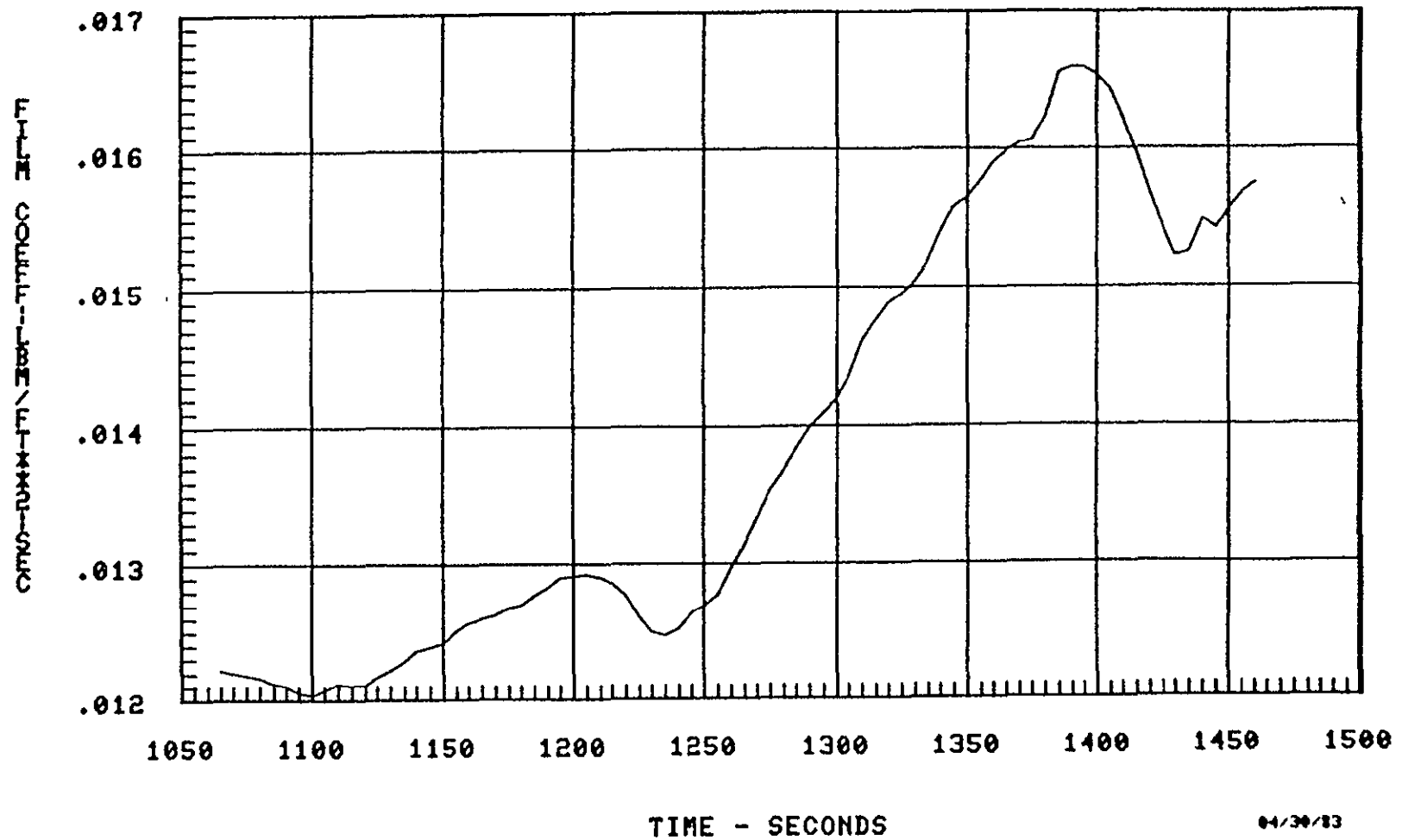


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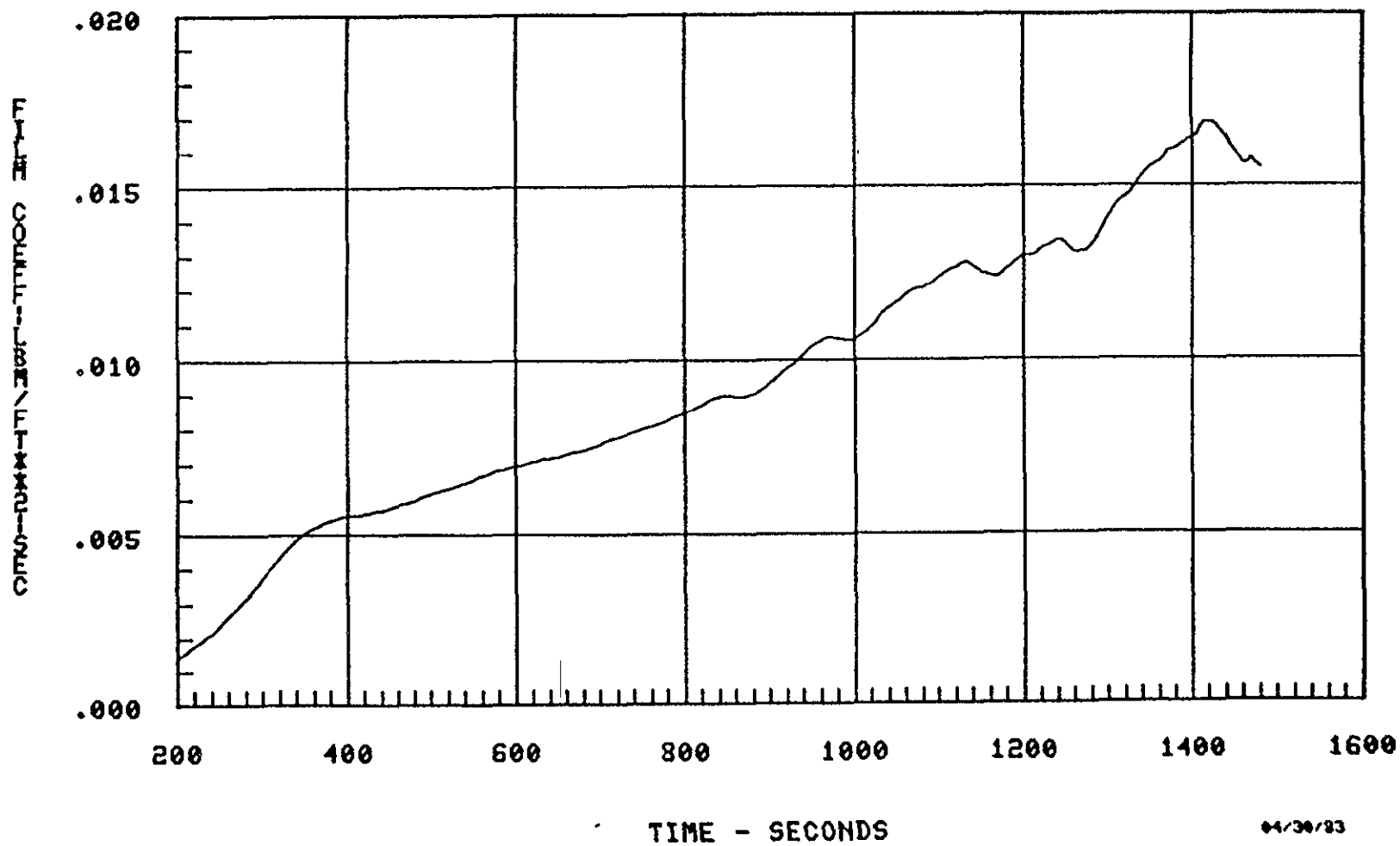
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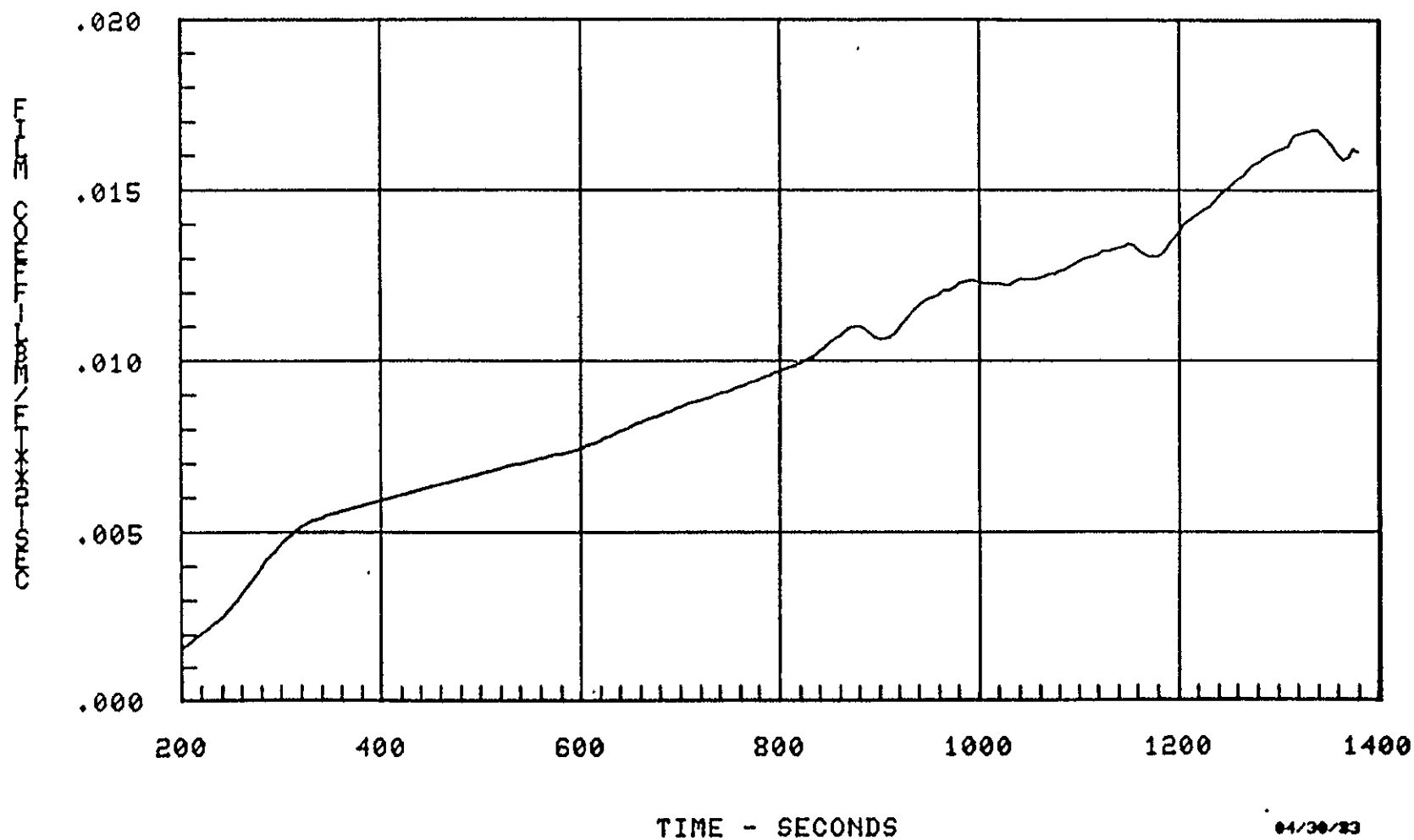
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# ST5-3 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

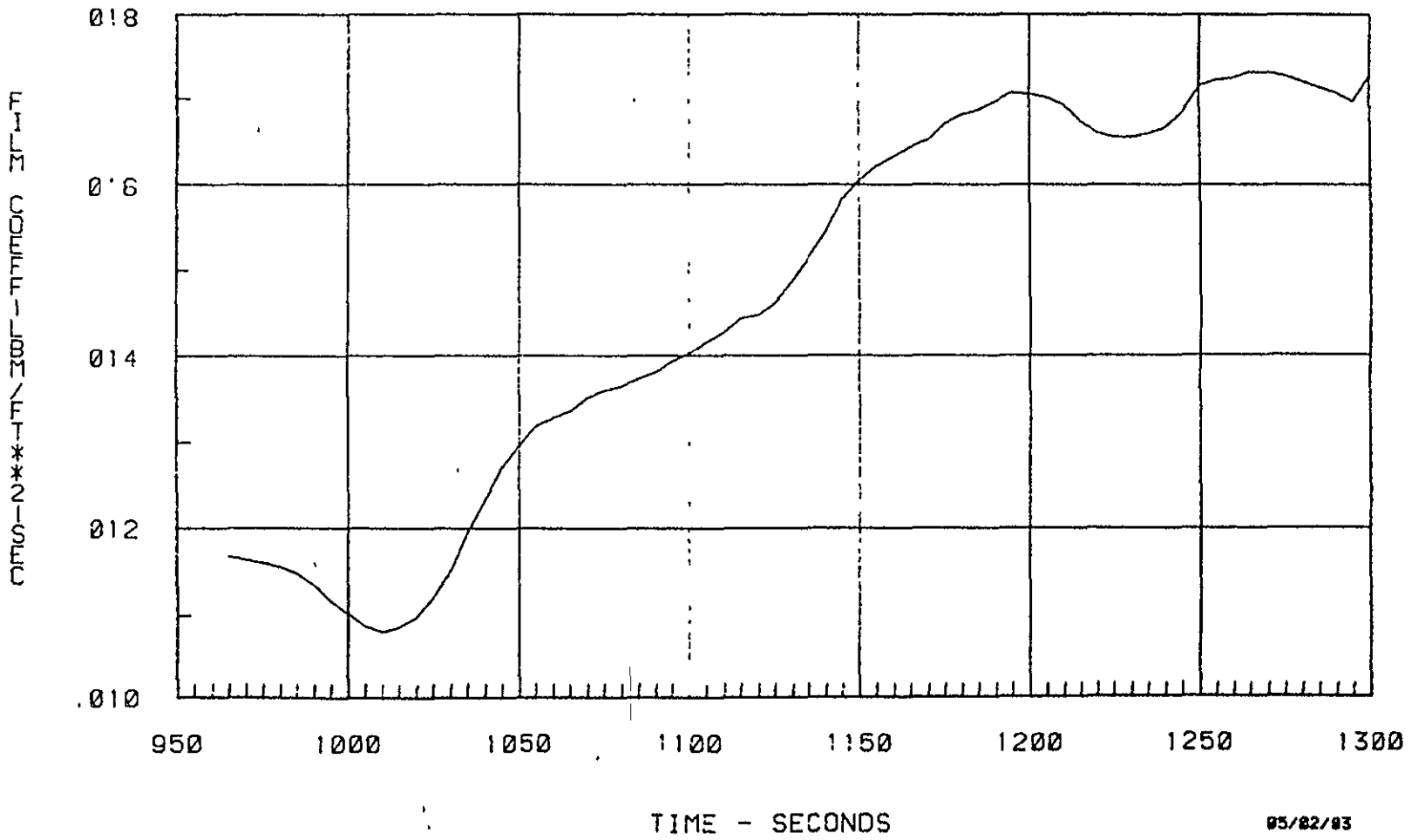
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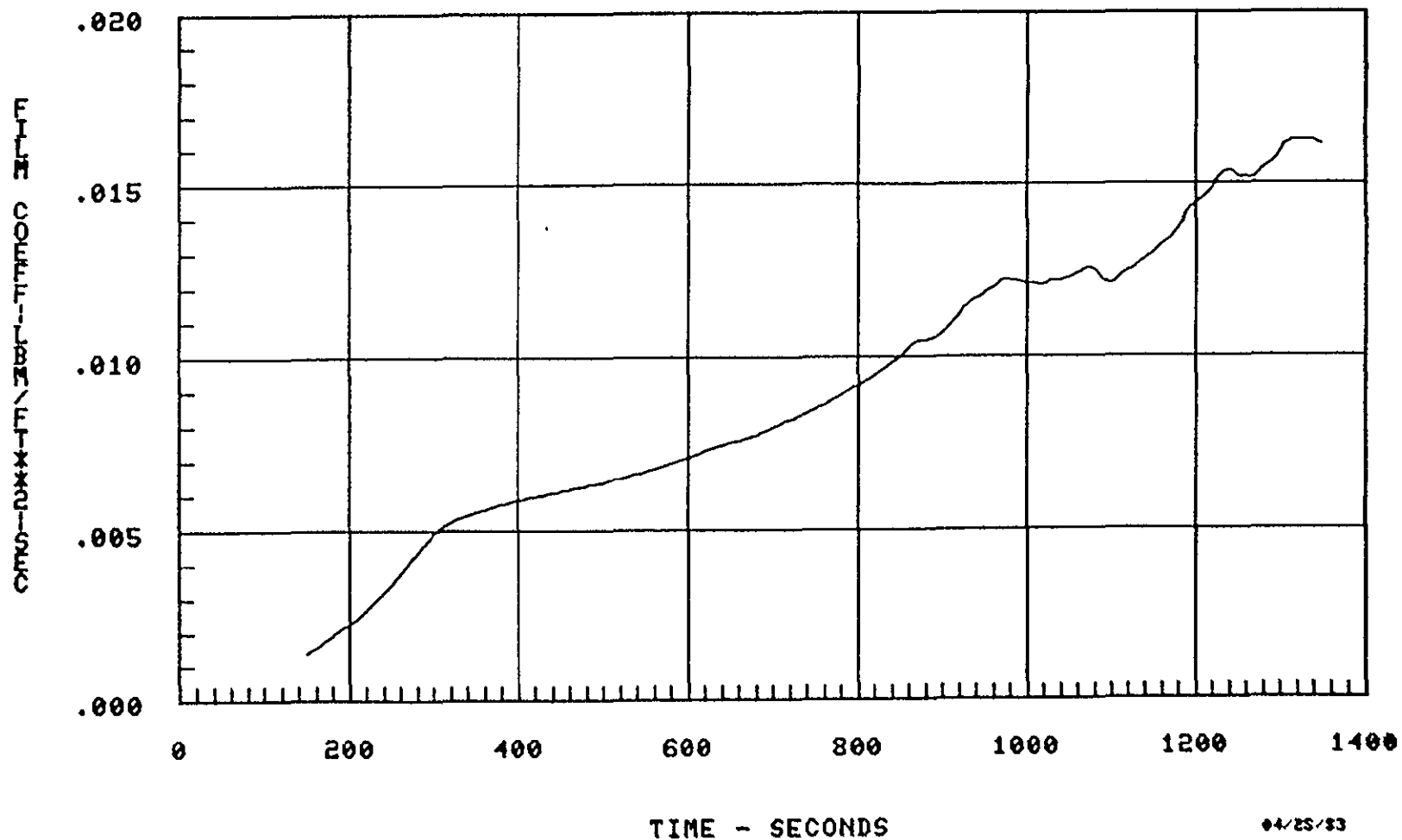


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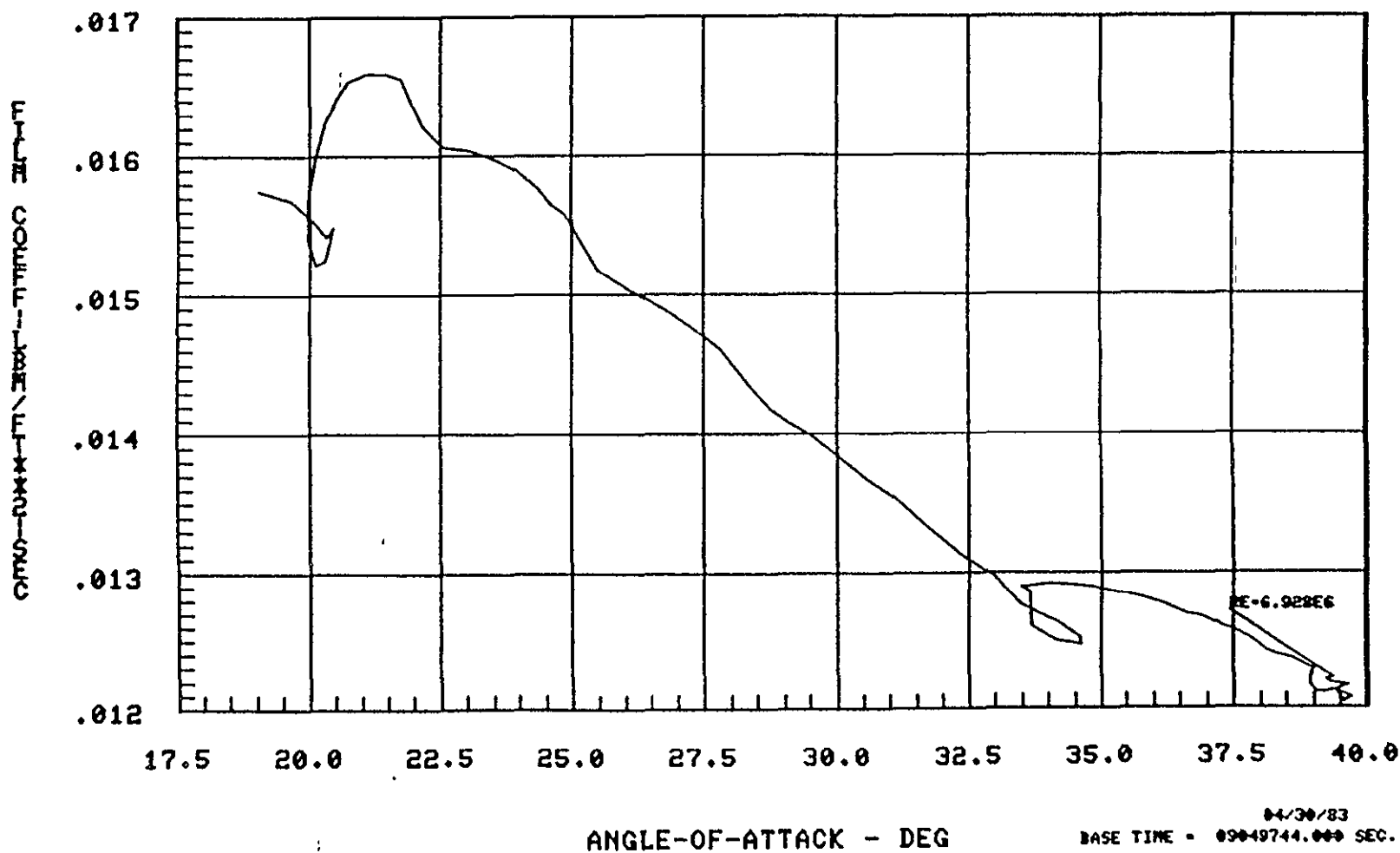


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1065-1460 SEC



A-56

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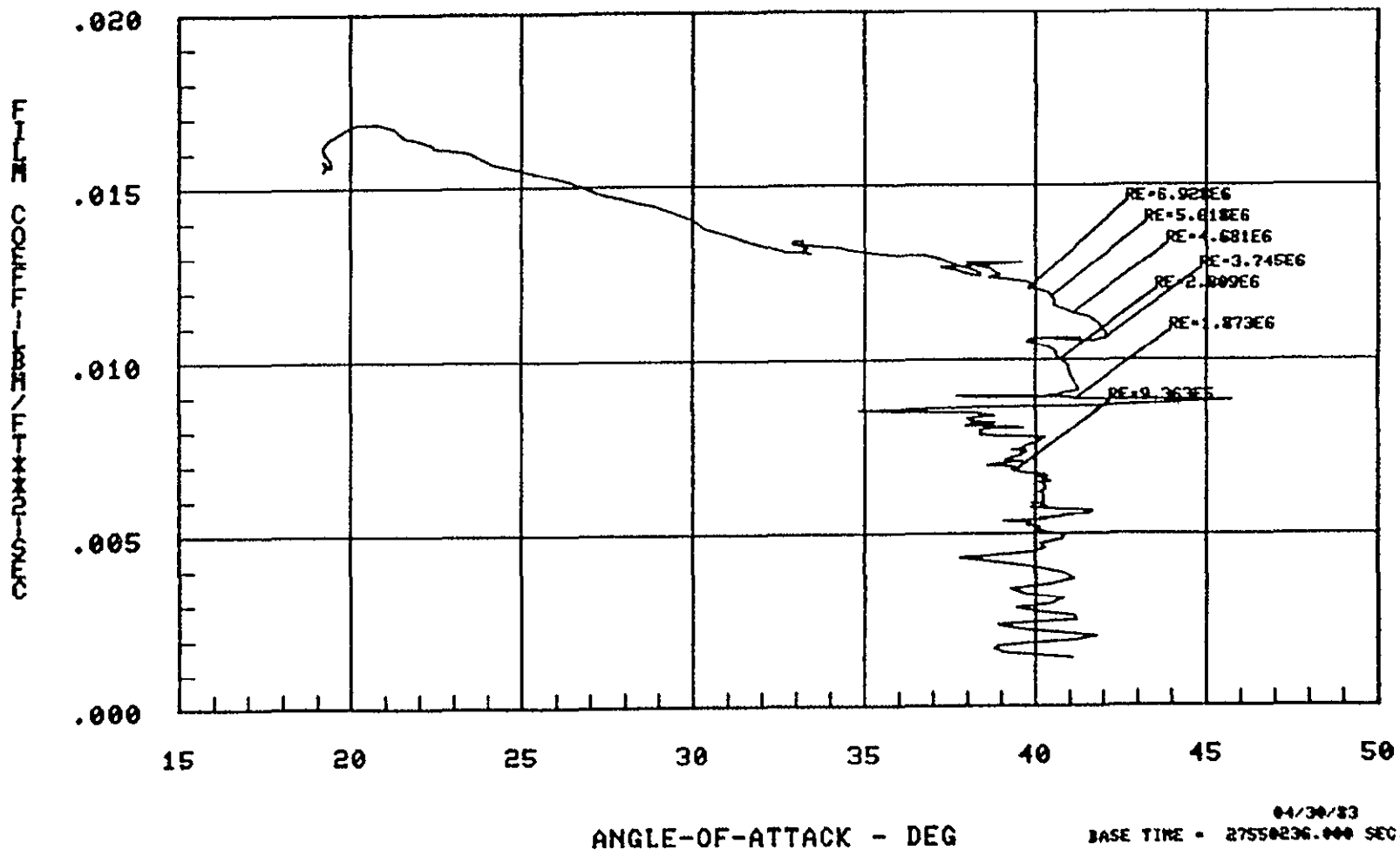
04/30/83

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— HREF

200-1480 SEC

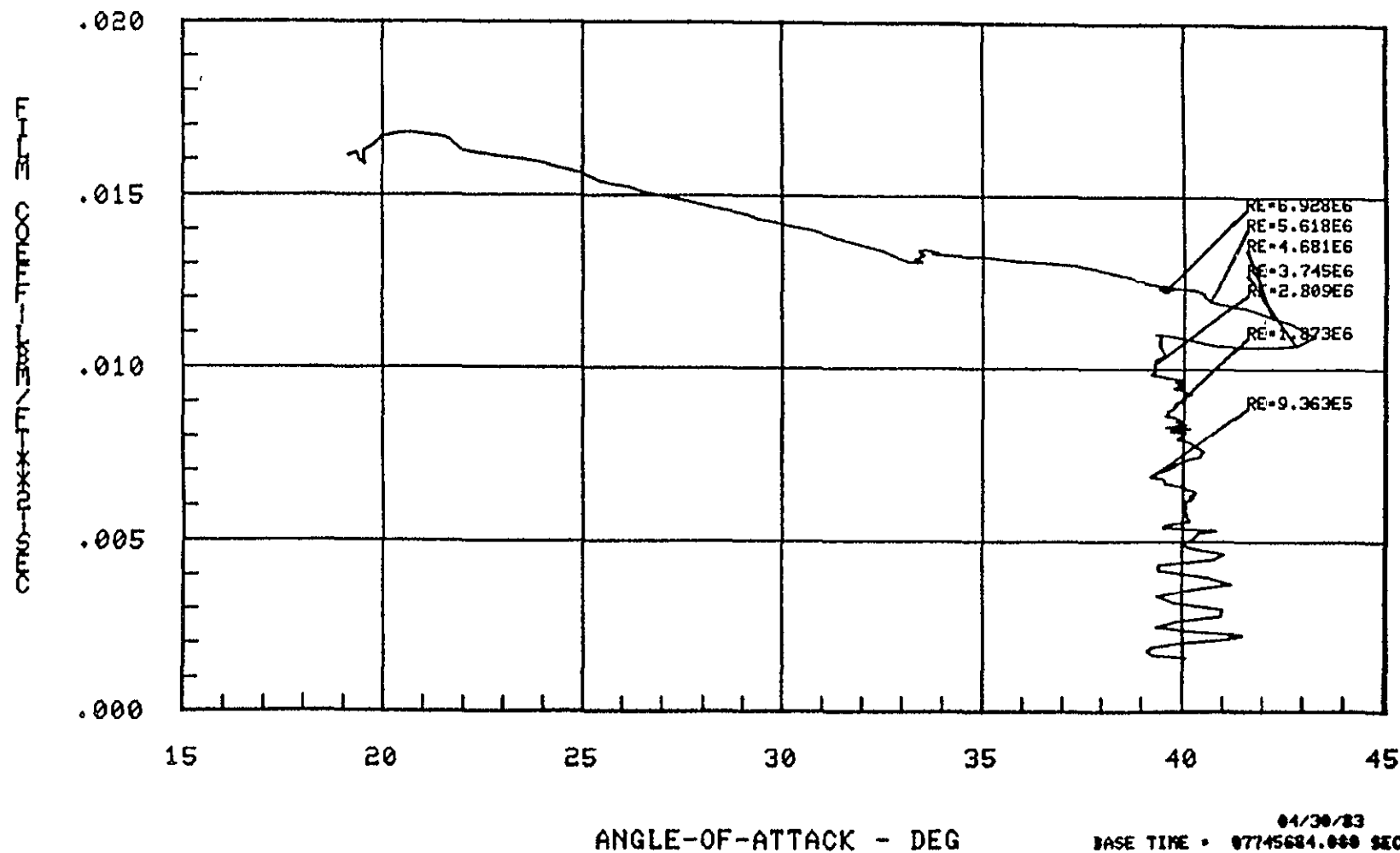


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HREF

200-1380 SEC

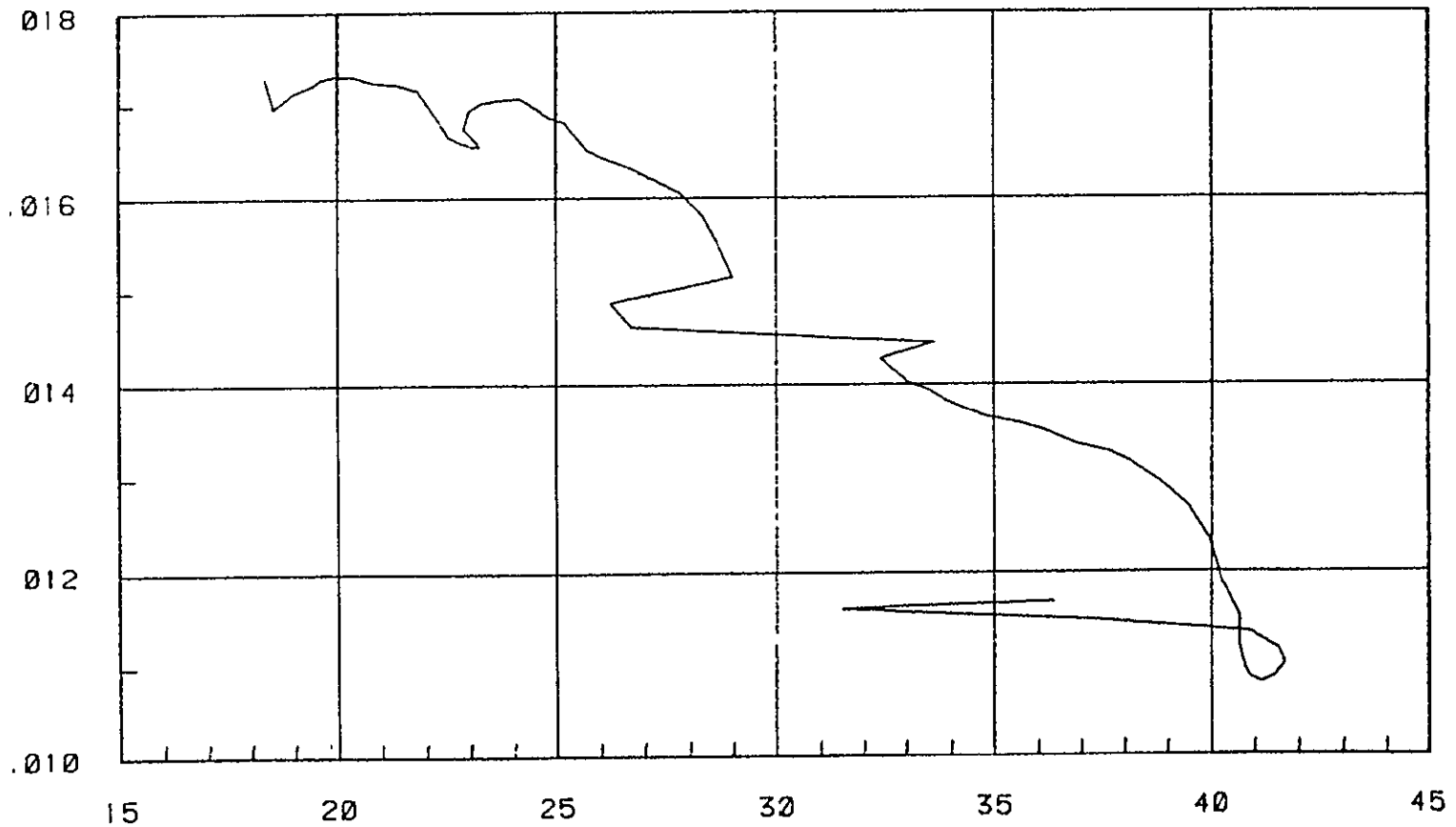


# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

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965-1300 SEC

WING COORDINATE SYSTEM



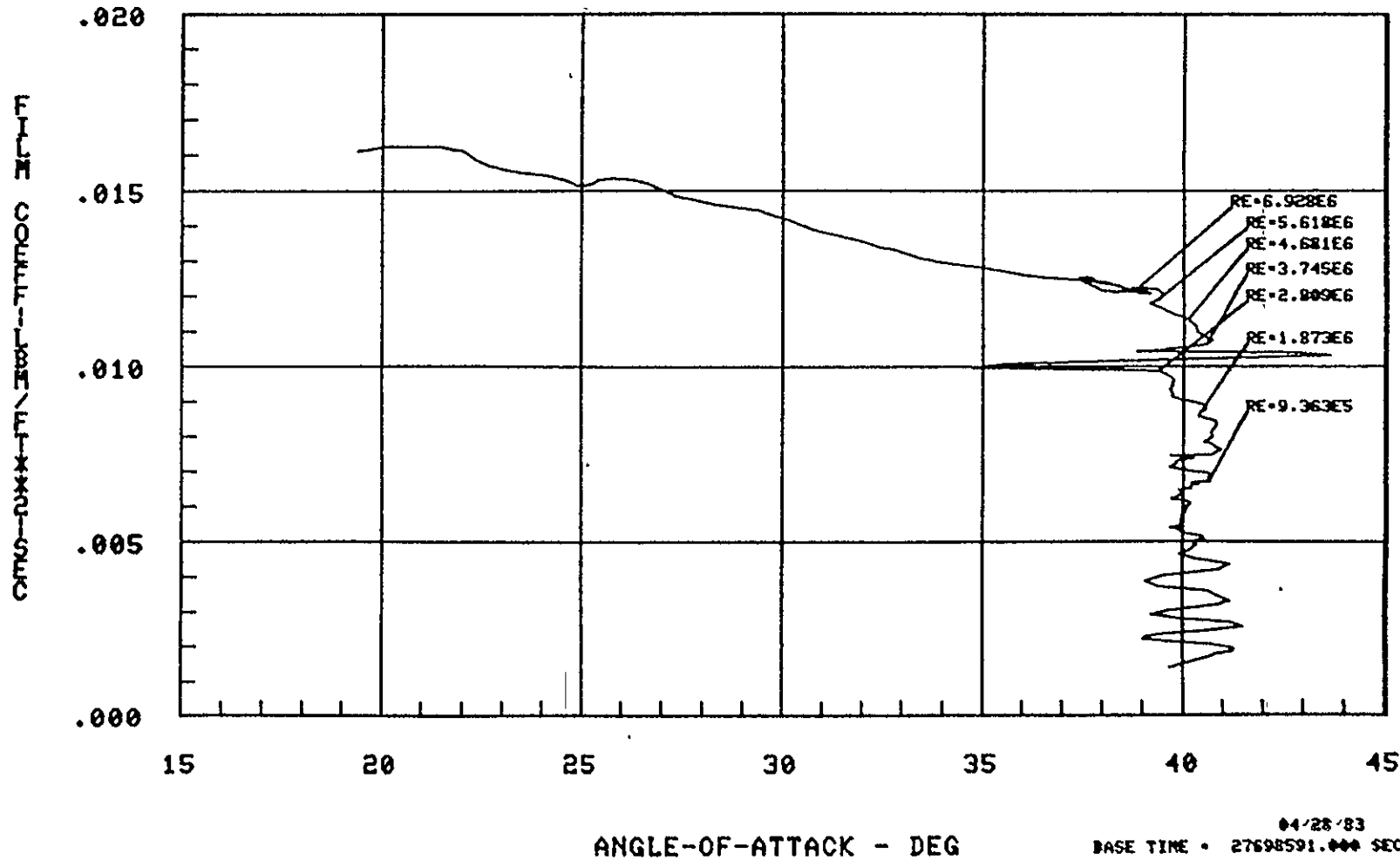
ANGLE-OF-ATTACK - DEG

85/02/83  
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— HREF

150-1350 SEC

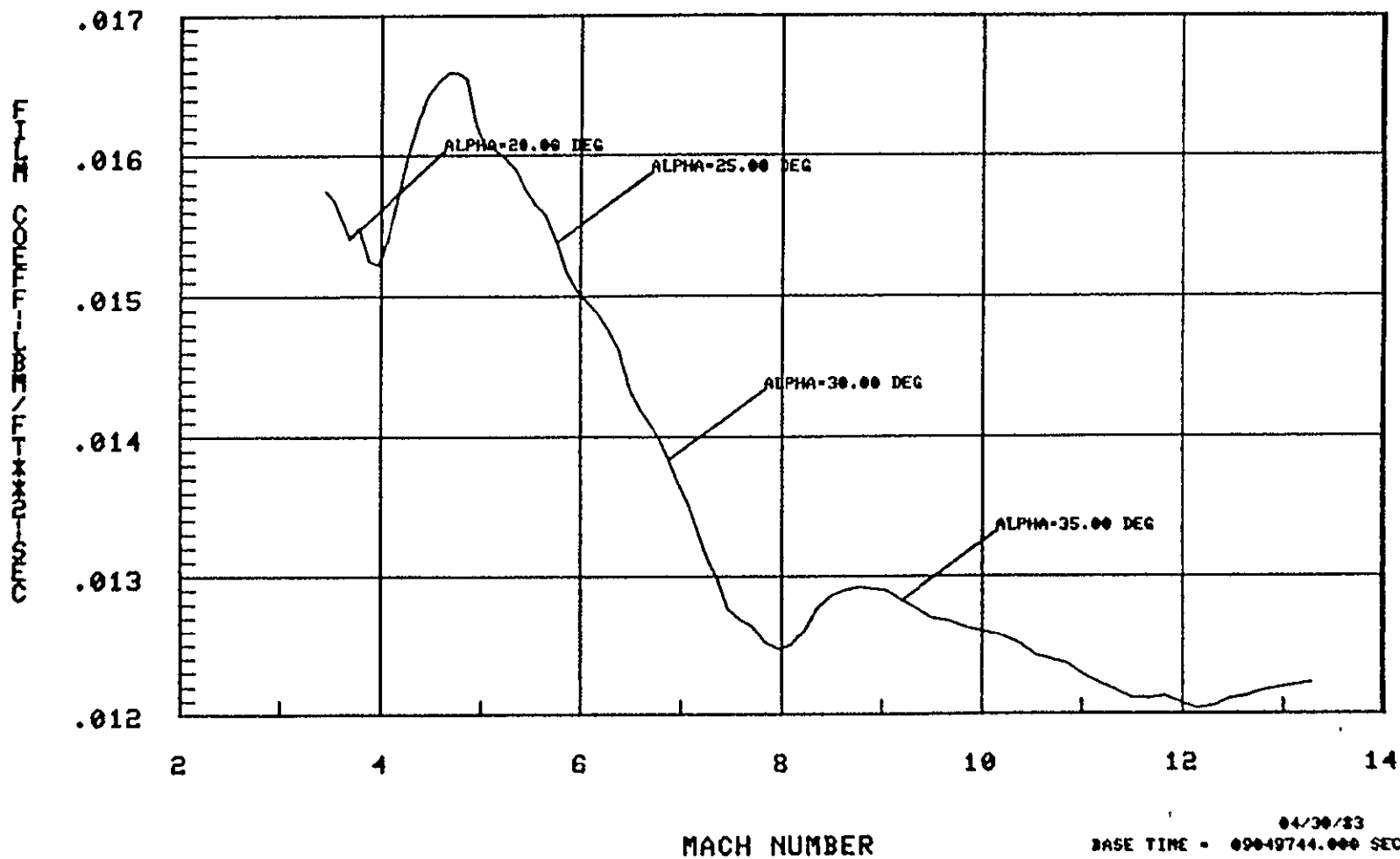


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1065-1460 SEC

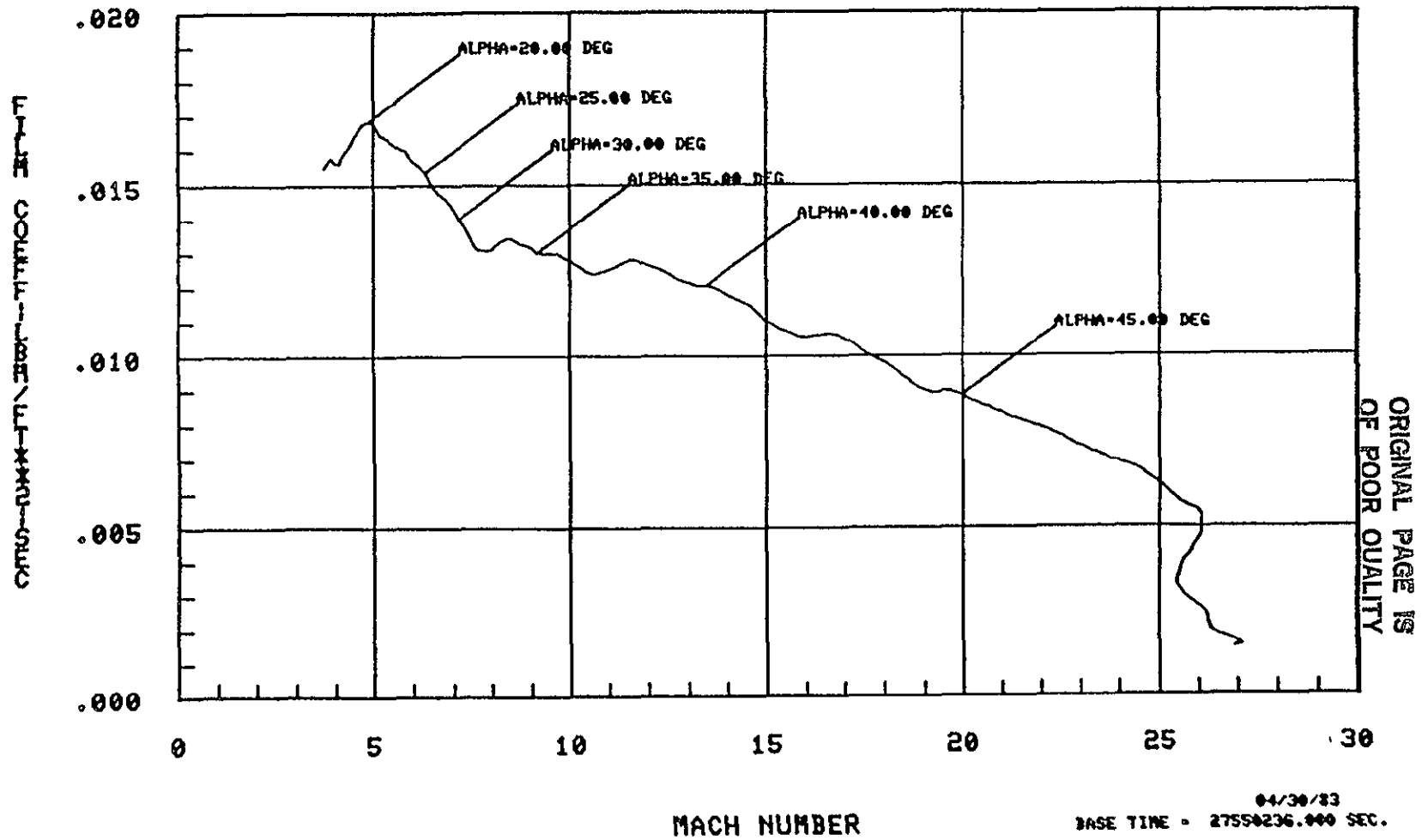


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200-1480 SEC

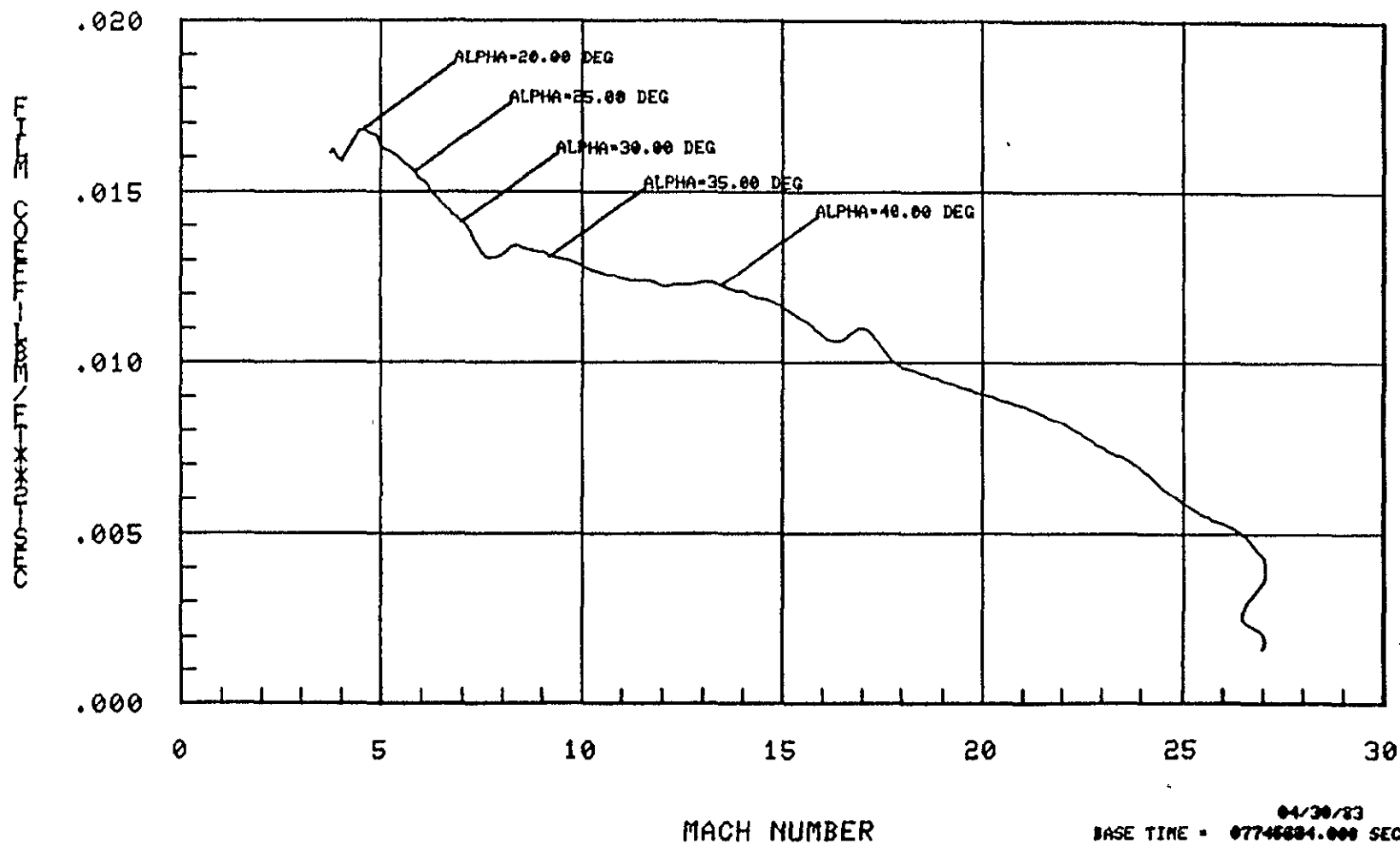




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200-1380 SEC



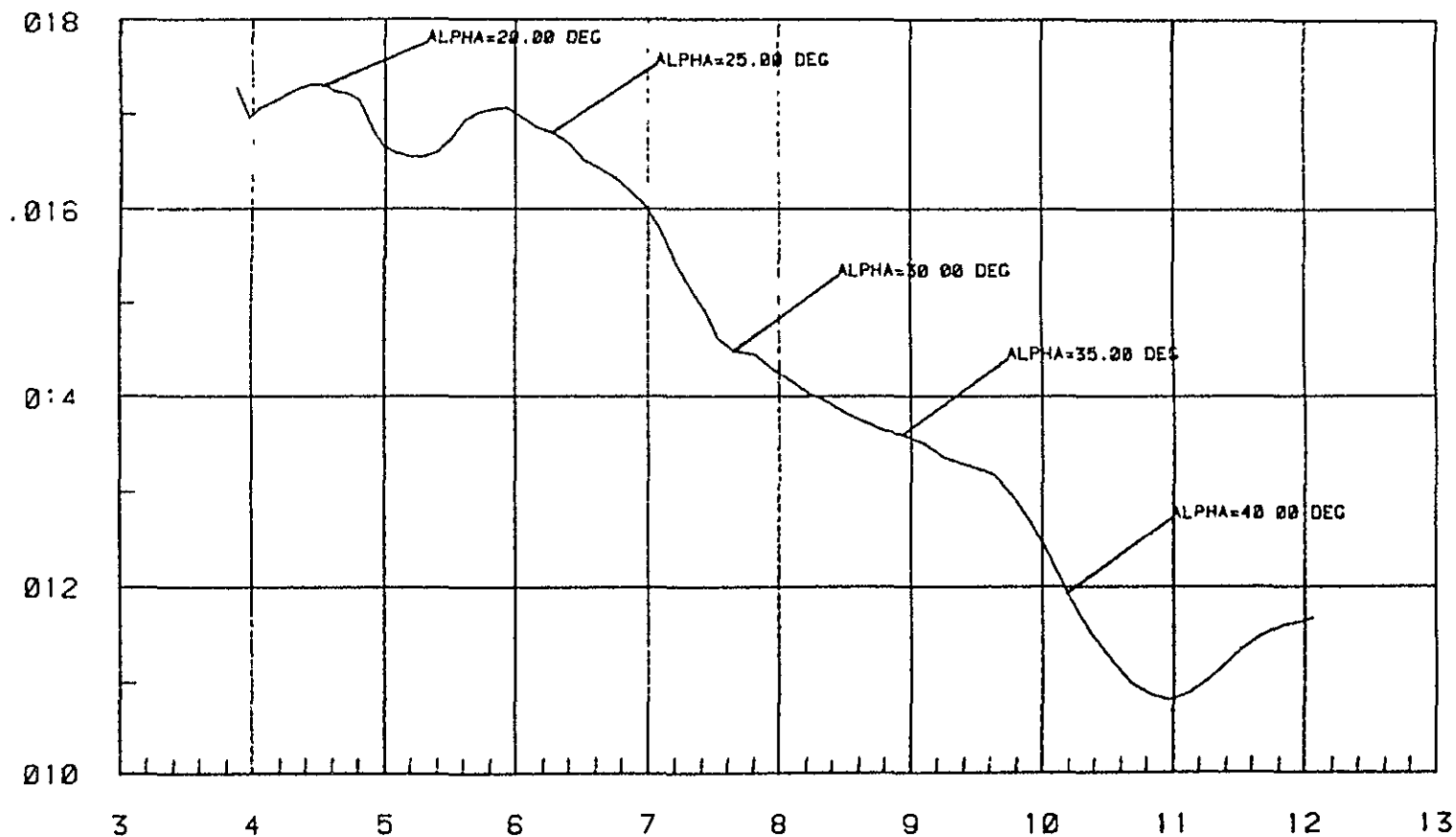
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# STS-4 (1107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

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065-1300 SEC

LE-115 COULTELL-JBE/EL\*\*N-SEC



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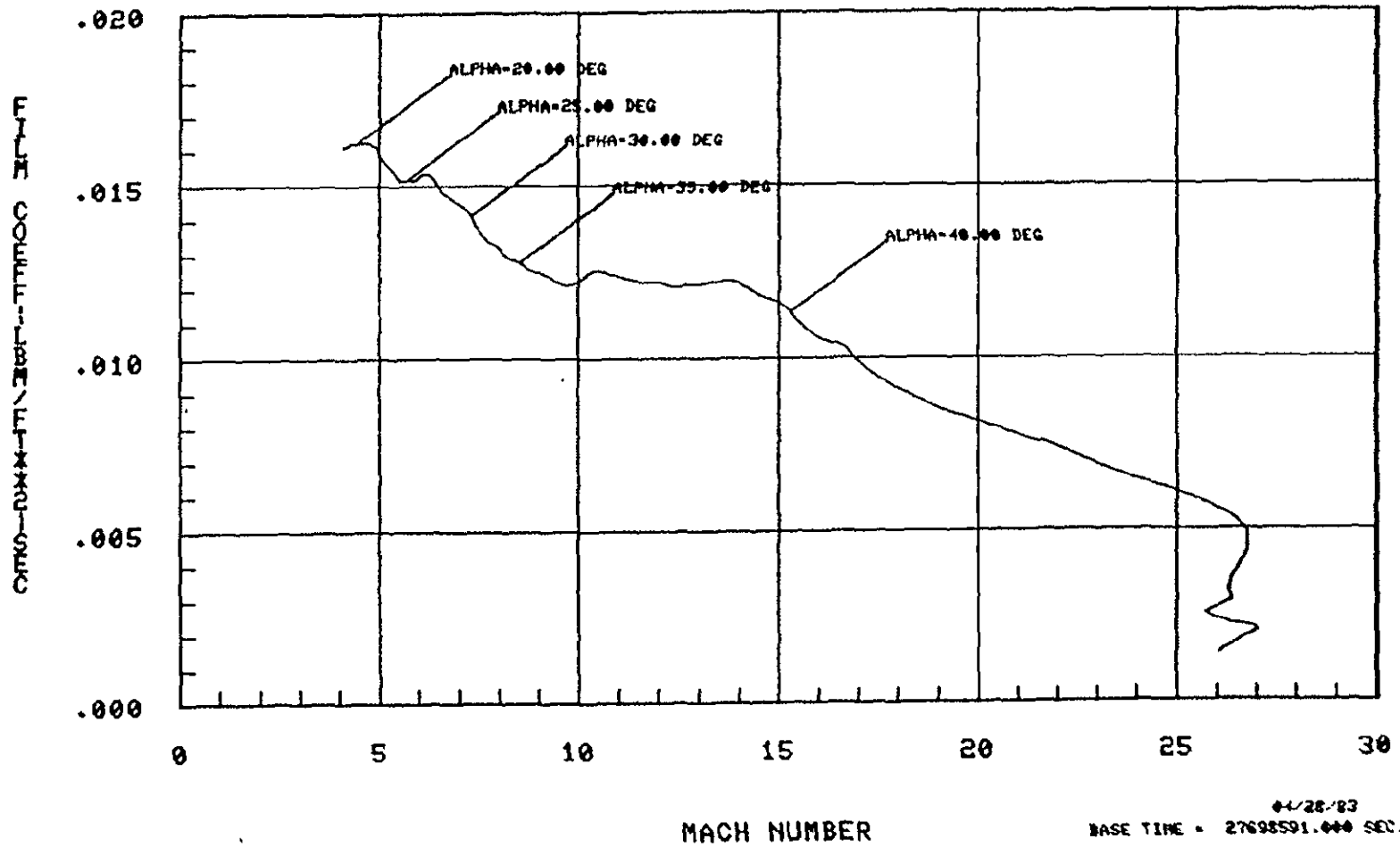
MACH NUMBER

05/02/83  
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150-1350 SEC

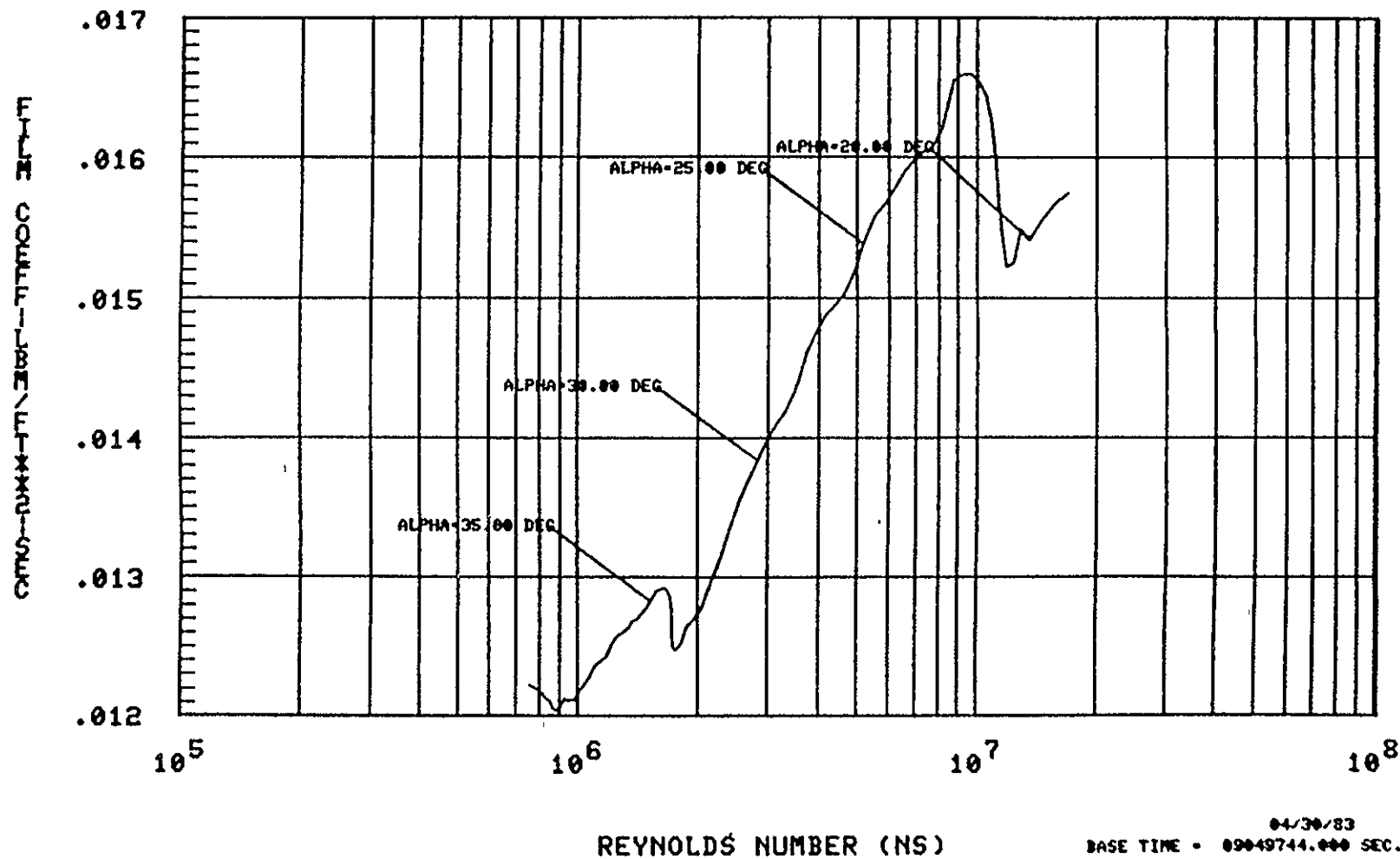


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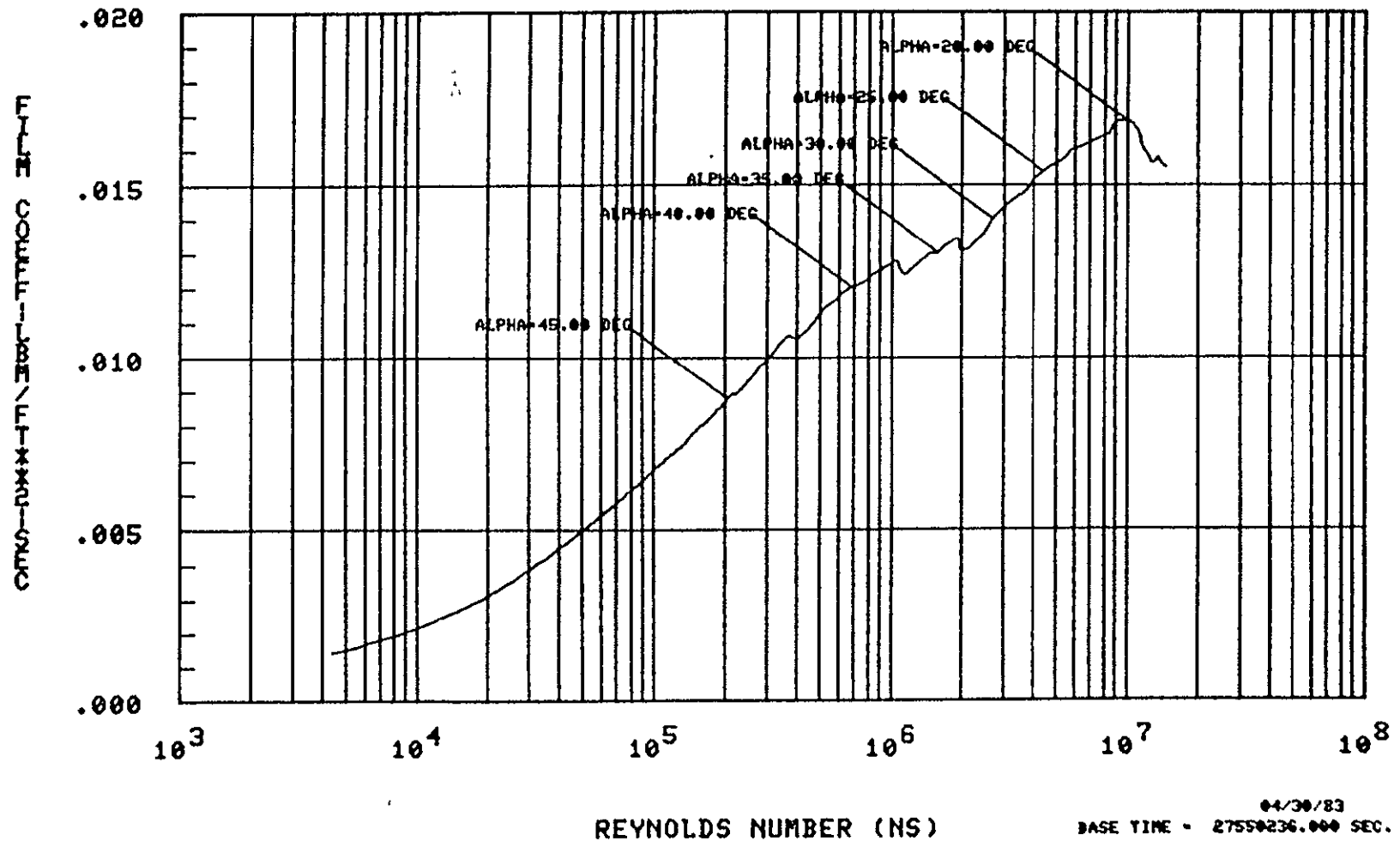
1065-1460 SEC



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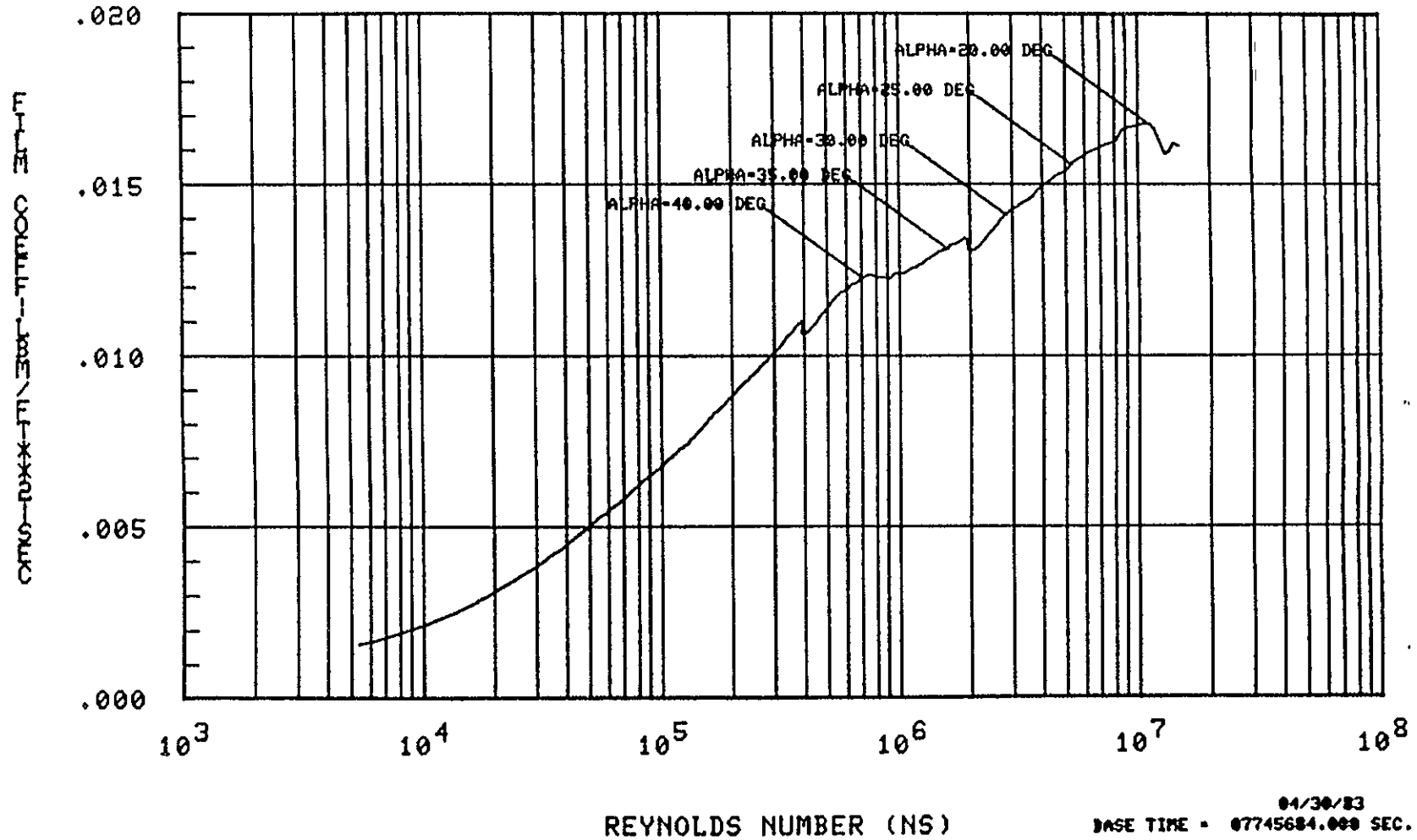
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200-1380 SEC



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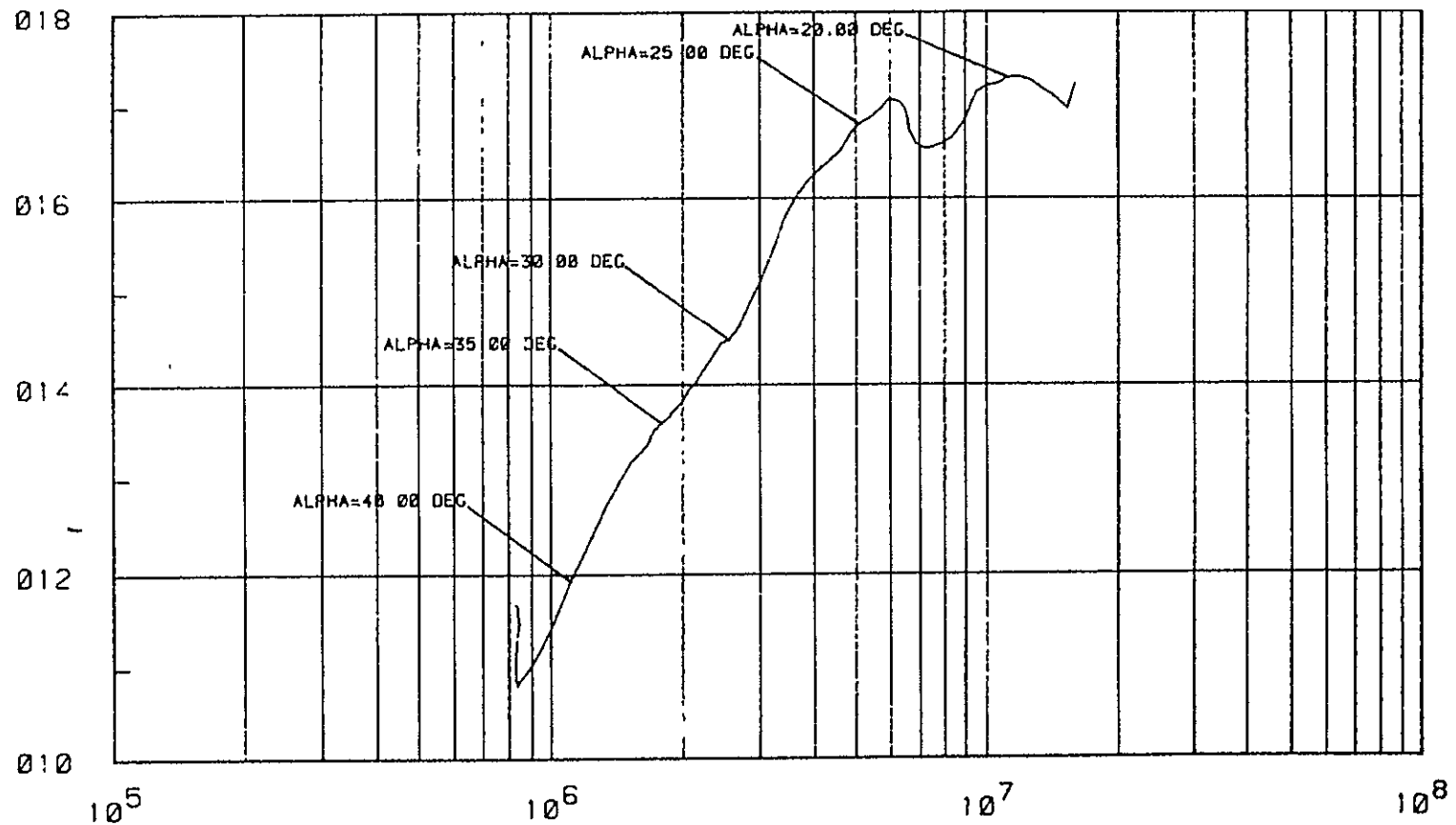
# STS-4 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

— HREF 065-1300 SEC

FILE C00000-1000-000-000

A-69

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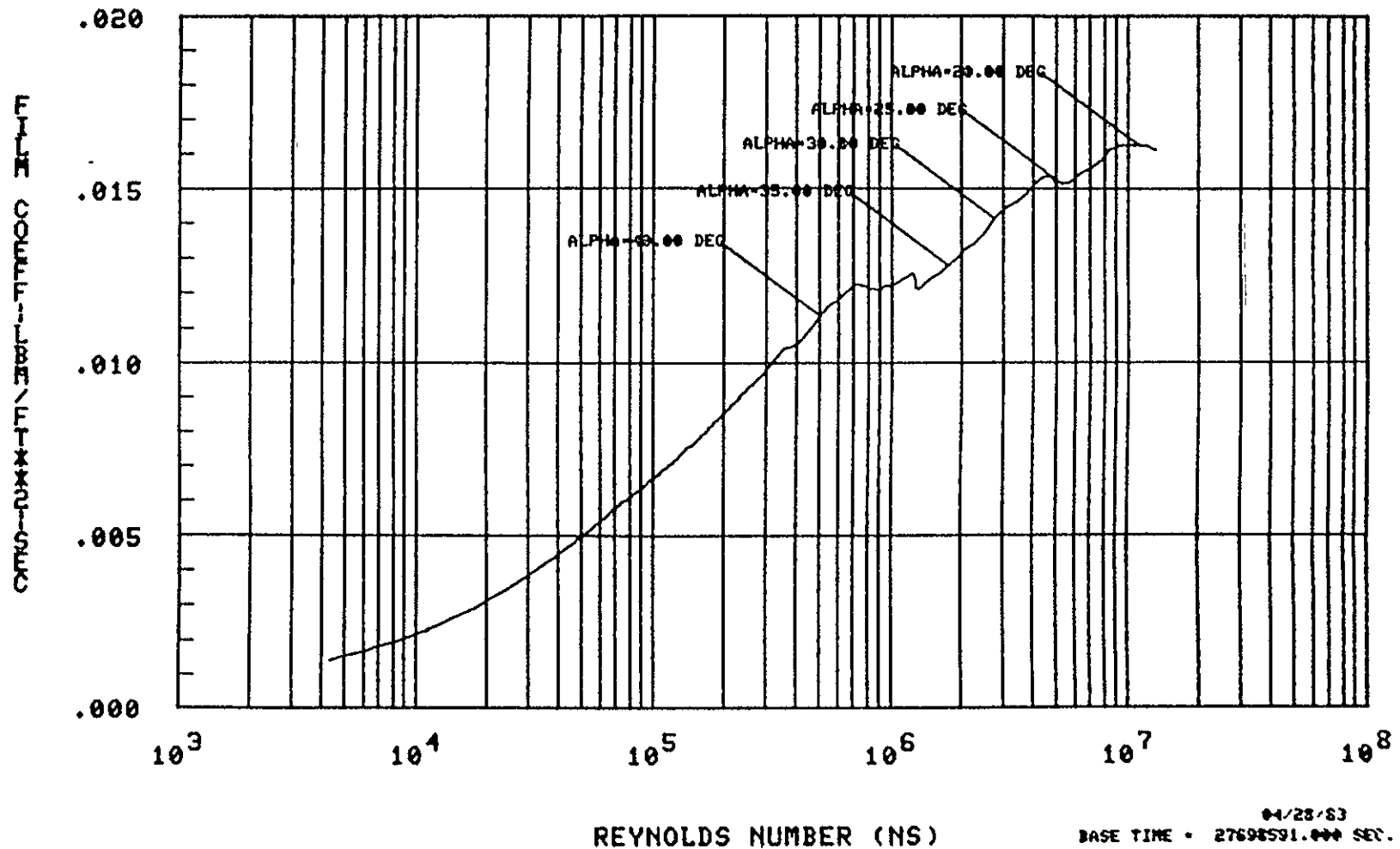
REYNOLDS NUMBER (NS)

05/02/83  
BASE TIME = 16040423 000 SEC

# STS-5 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

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150-1350 SEC



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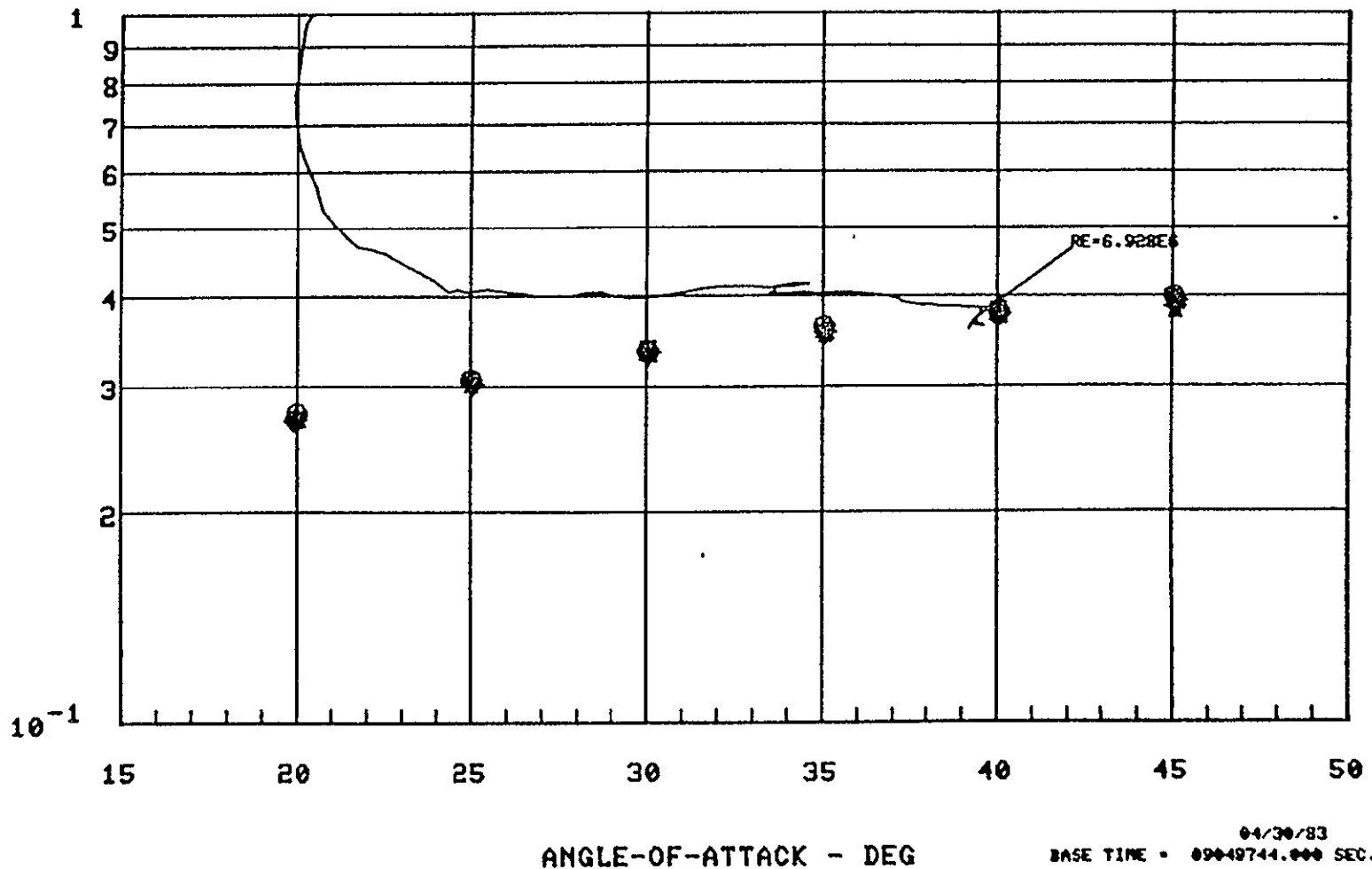


# STS-1 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9341A/H-REF 1065-1460 SEC



B-1

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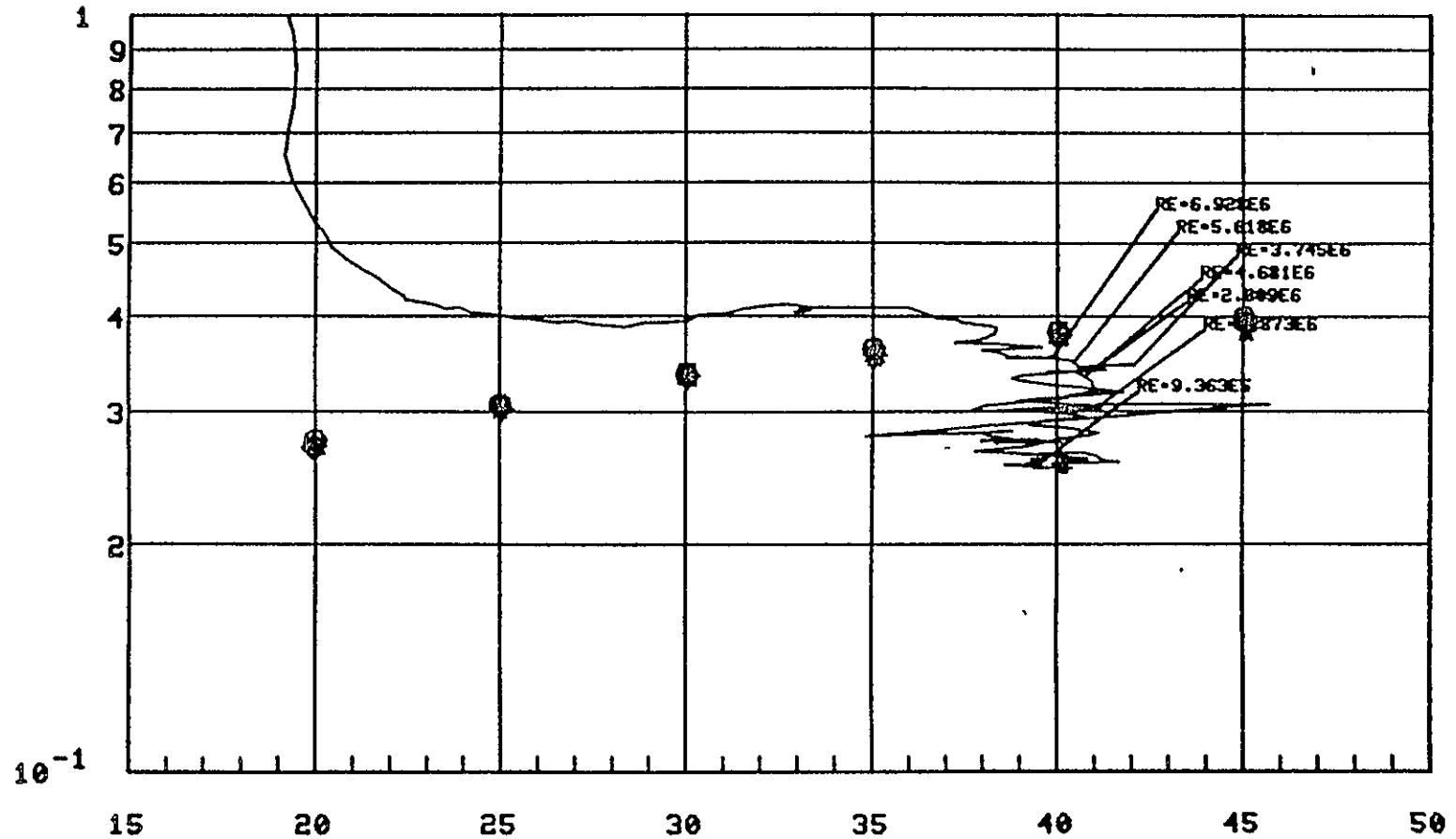
# STS-2 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9341A/H-REF 200-1480 SEC

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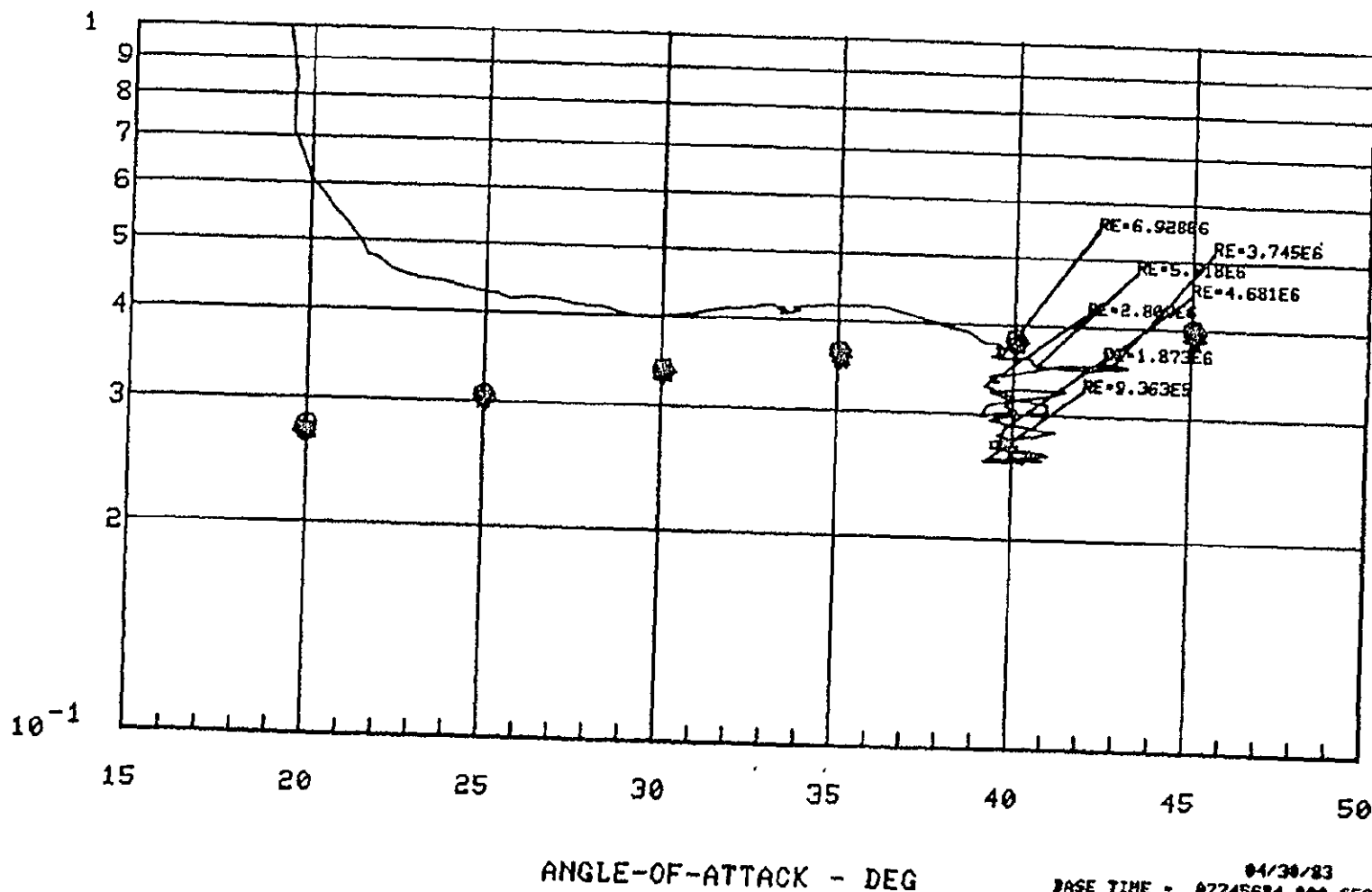
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# STS-3 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9341A/H-REF 200-1380 SEC



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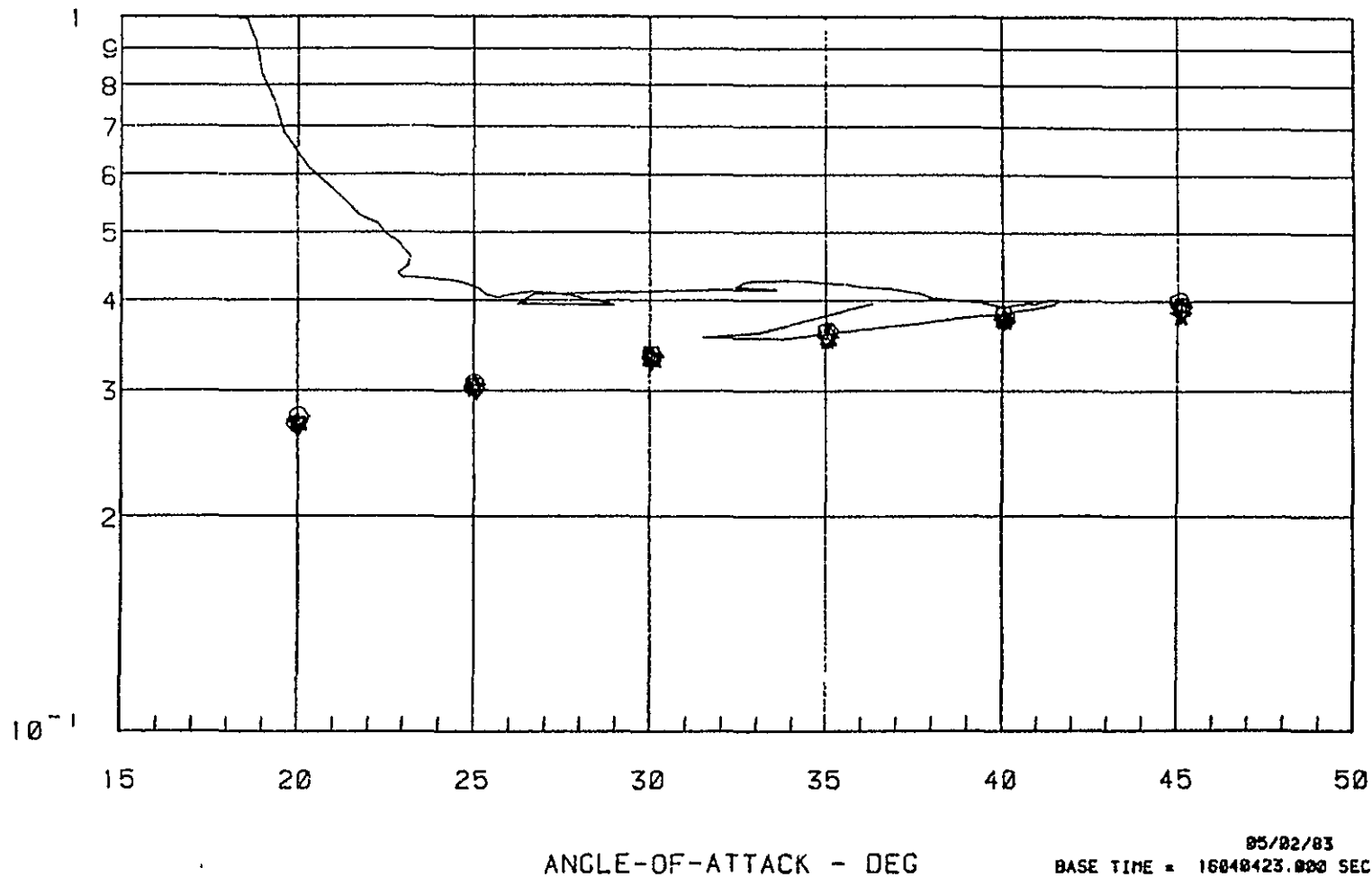
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# STS-4 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 0 0175 SCALE RE = 0.5 E06  
OH49 0 0175 SCALE RE = 1.0 E06  
OH49 0 0175 SCALE RE = 1.5 E06  
OH49 0 0175 SCALE RE = 2.0 E06  
OH49 0 0175 SCALE RE = 2.5 E06  
OH49 0 0175 SCALE RE = 3.0 E06  
OH49 0 0175 SCALE RE = 3.7 E06

V09T0341A/H-REF 965-1300 SEC



B-4

W-11E 000000 - H/I-0000

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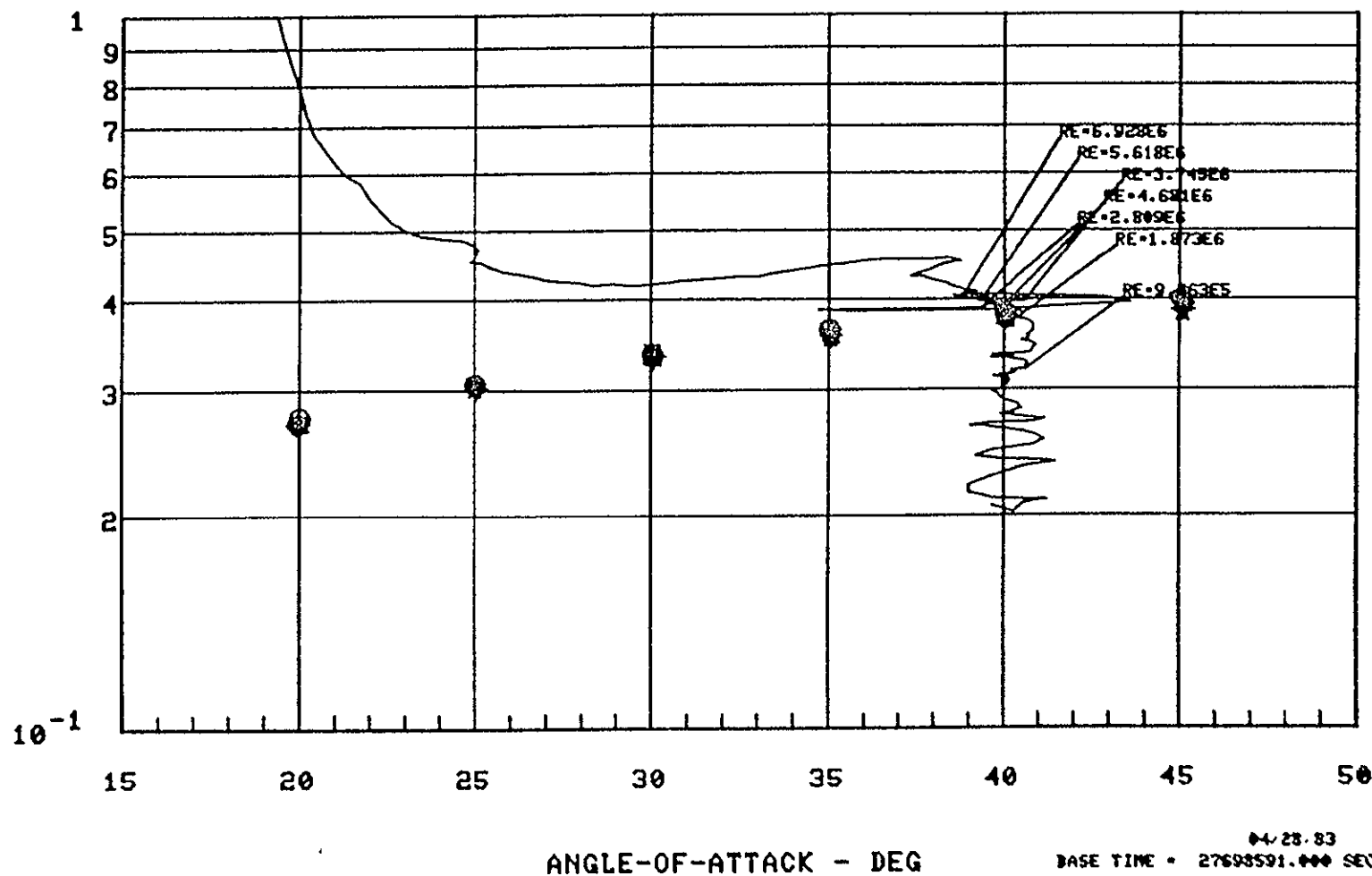
# STS-5 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
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U09T9341A/H-REF 150-1350 SEC

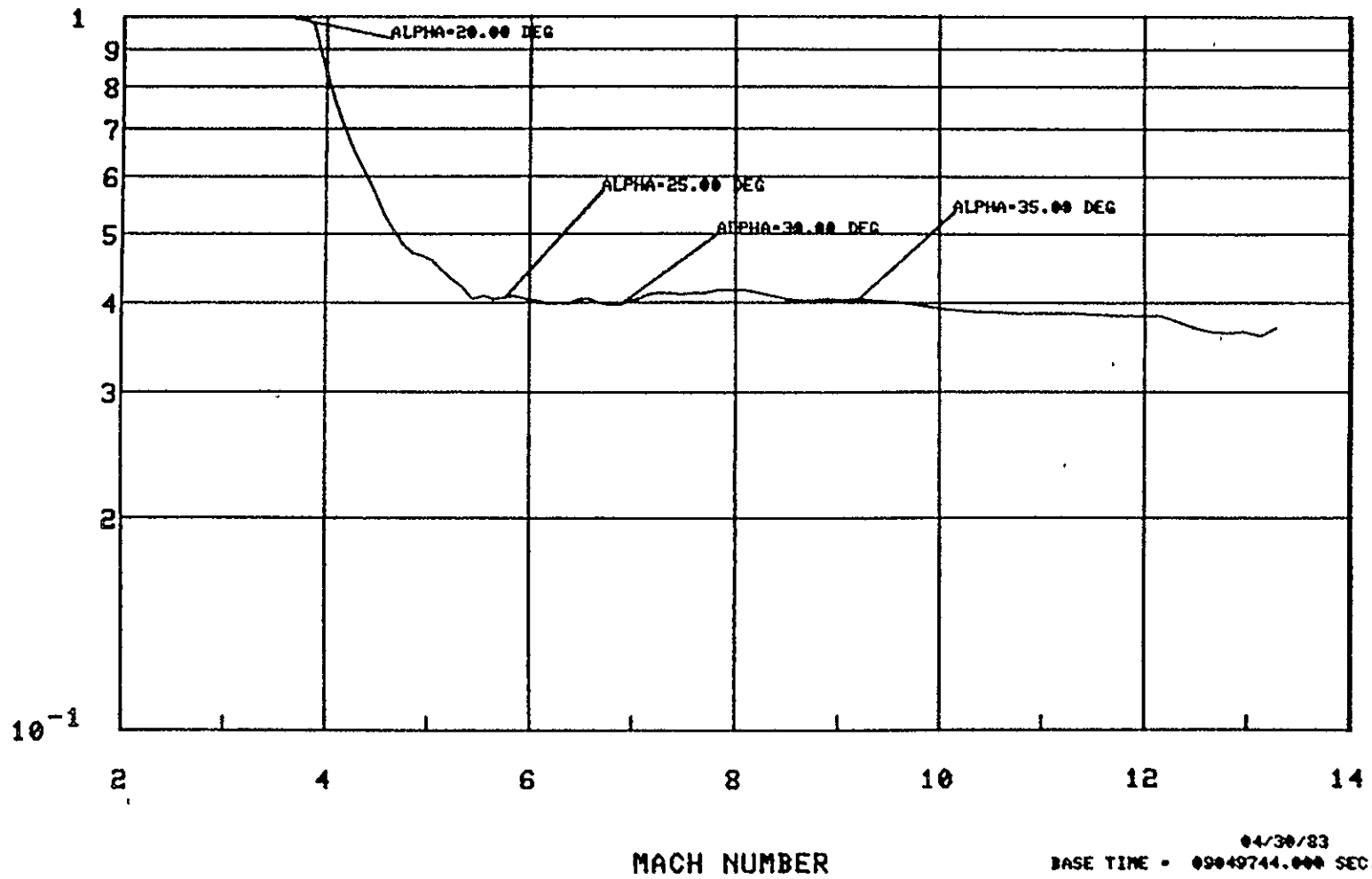
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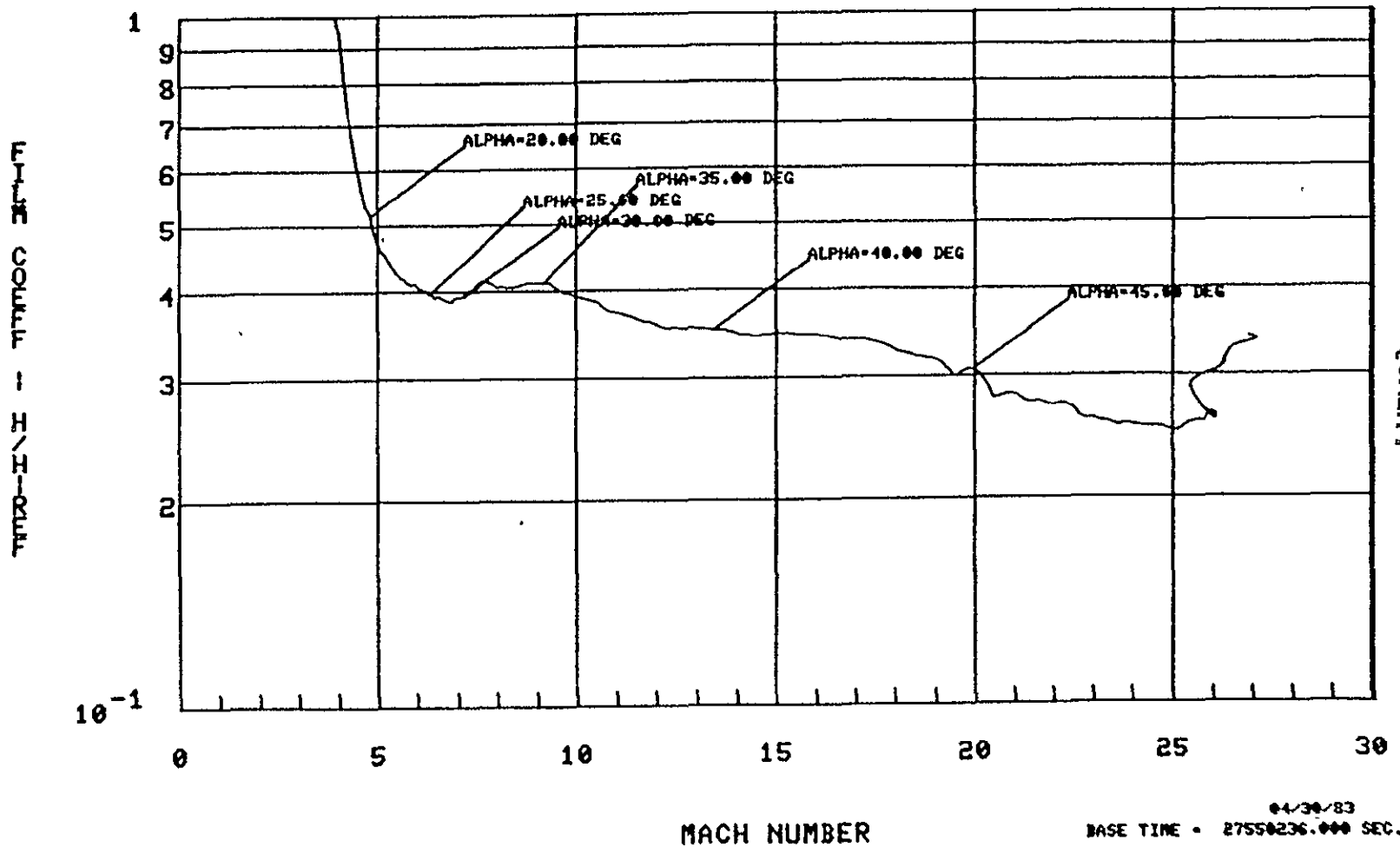
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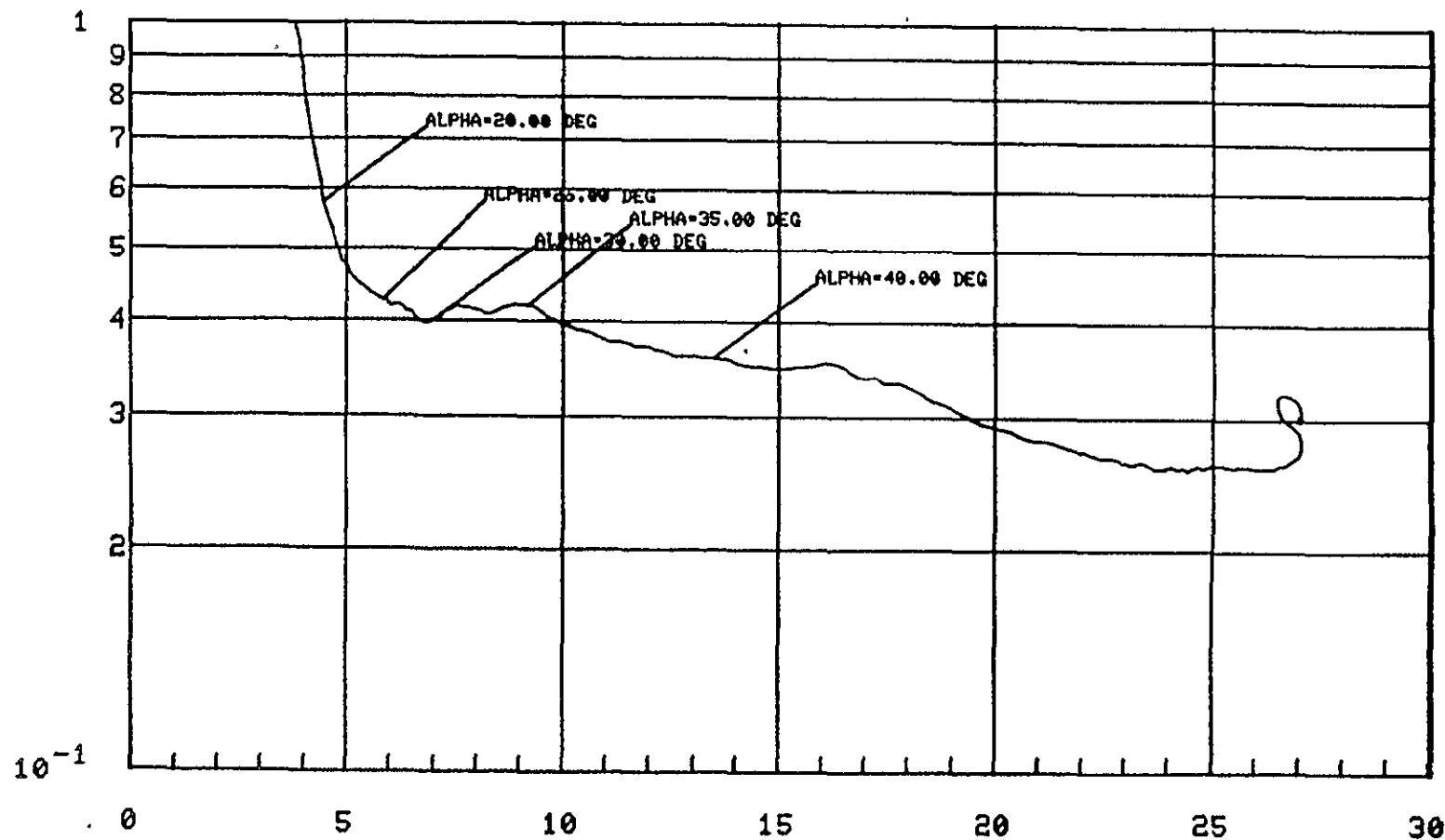
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# STS-3 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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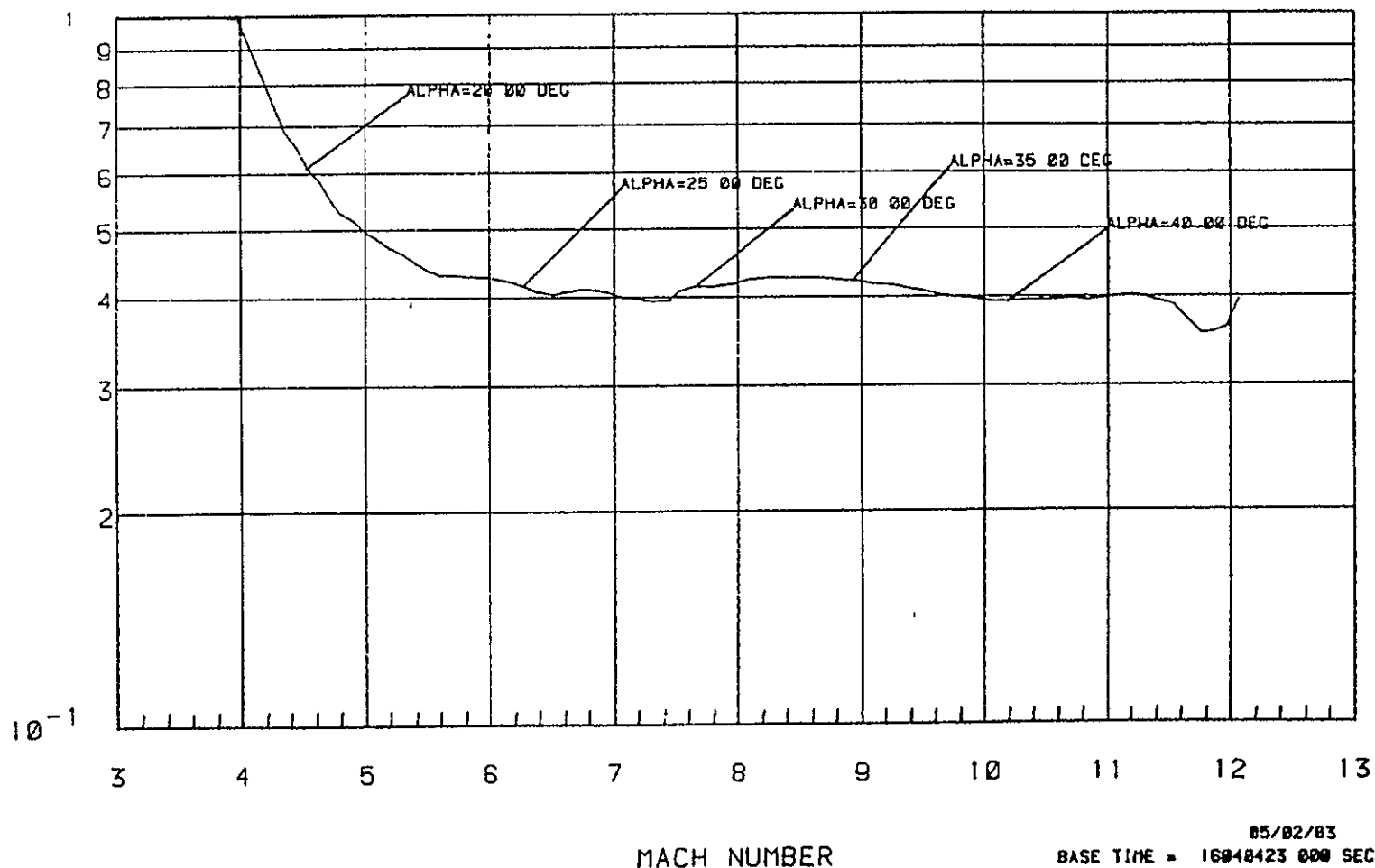


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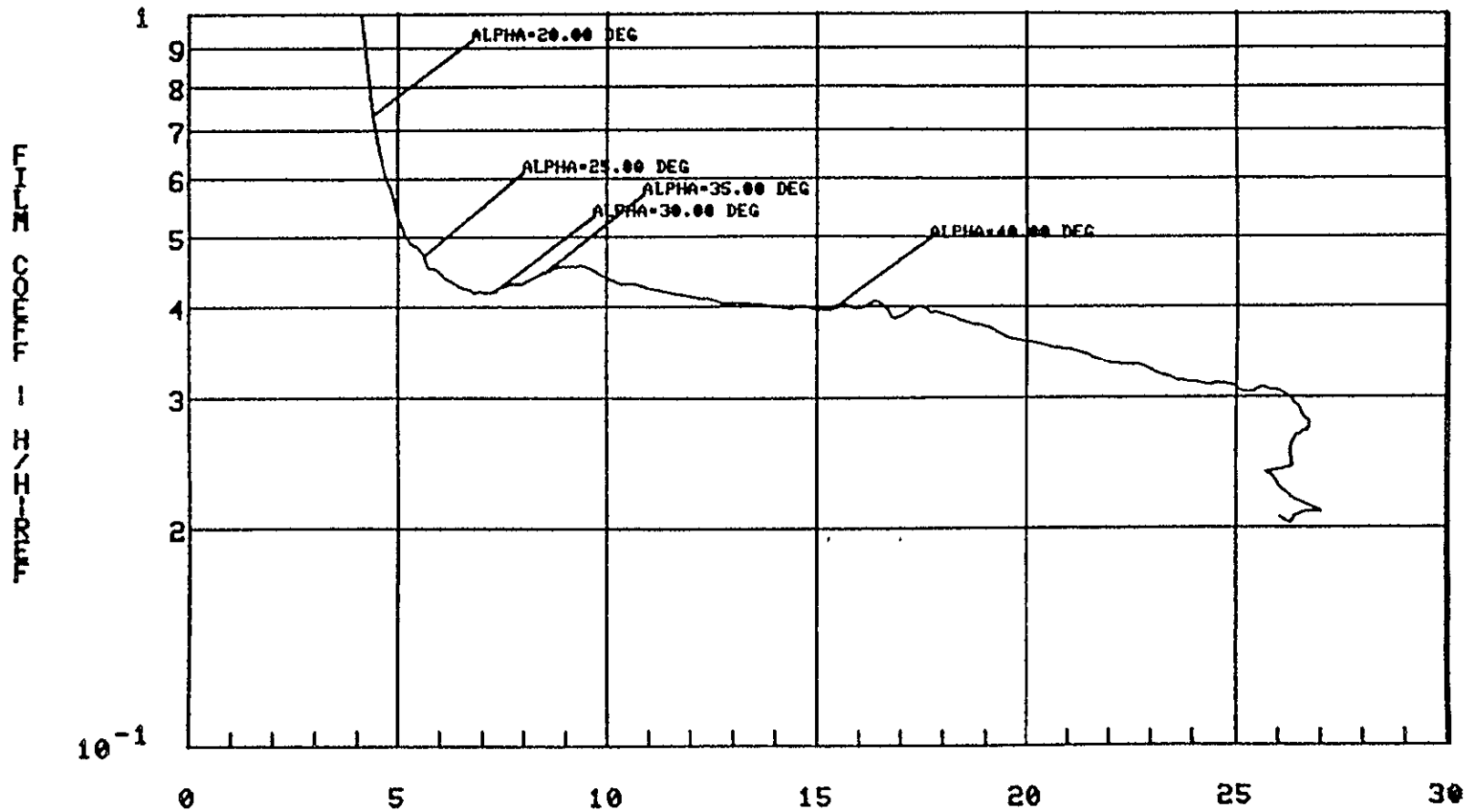
B-9



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# STS-5 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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B-10

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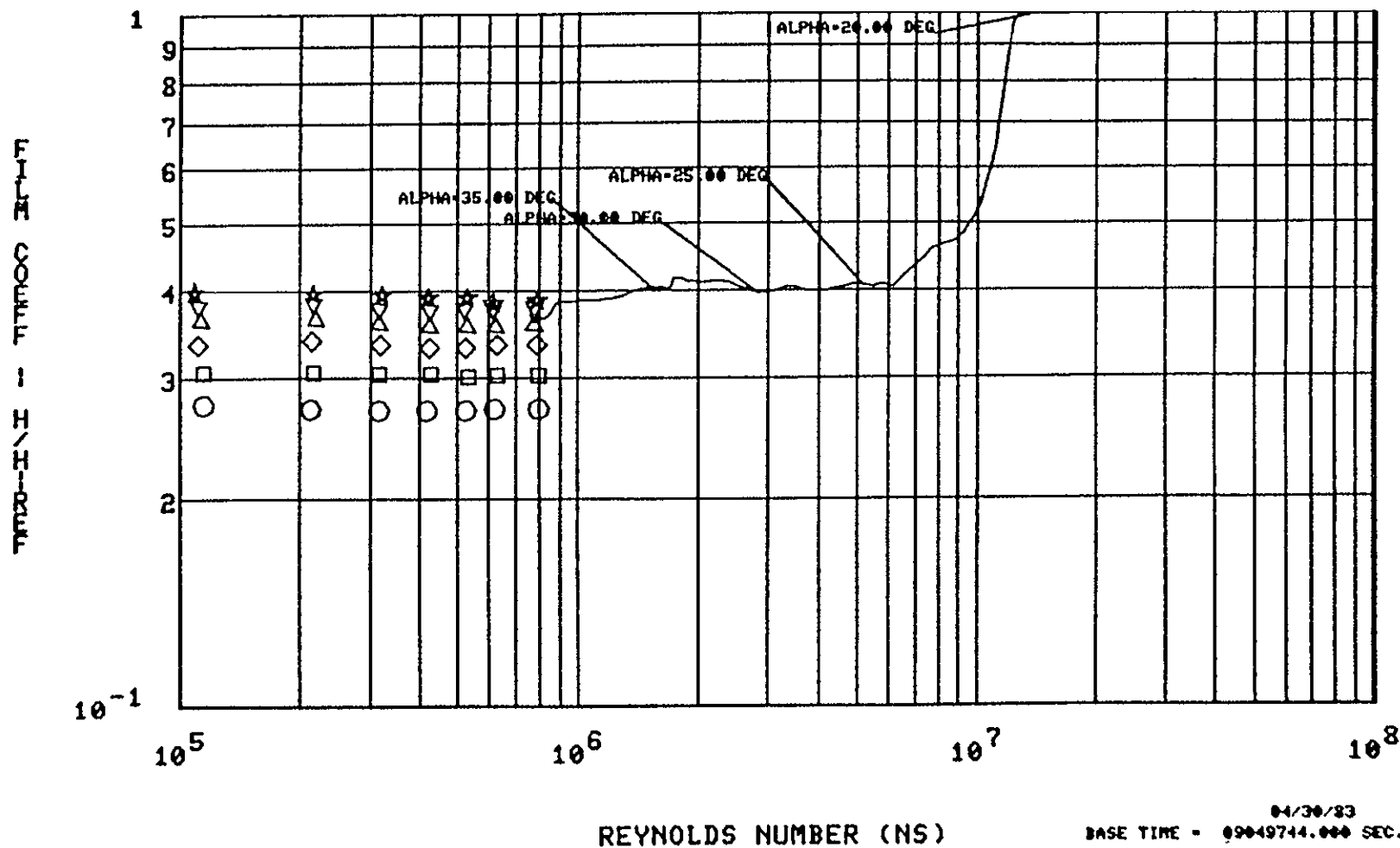
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# STS-1 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

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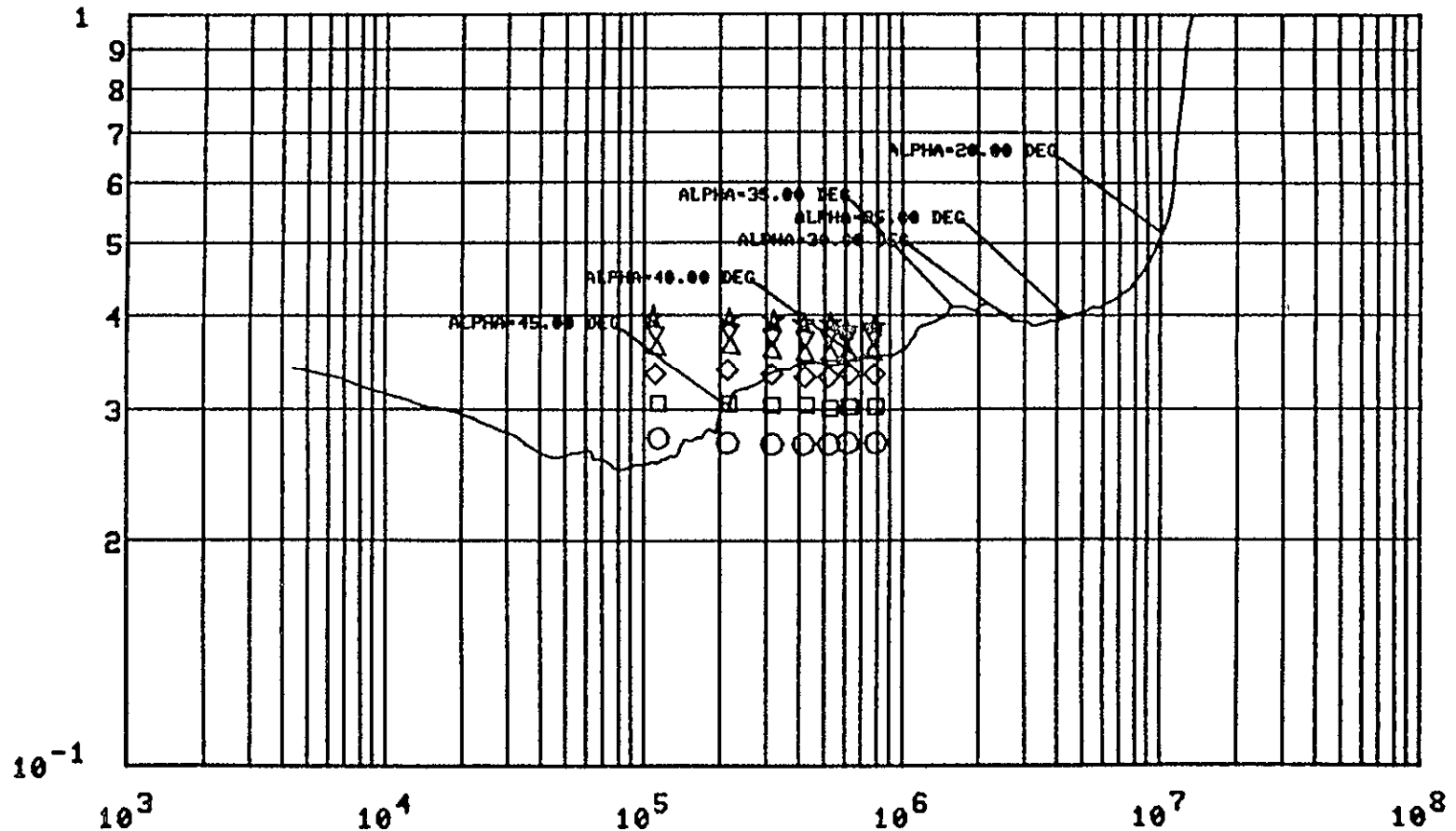
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# STS-2 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

○ OH49 ALPHA = 20 DEGREES  
 □ OH49 ALPHA = 25 DEGREES  
 ◇ OH49 ALPHA = 30 DEGREES  
 △ OH49 ALPHA = 35 DEGREES  
 ▼ OH49 ALPHA = 40 DEGREES  
 ★ OH49 ALPHA = 45 DEGREES

U09T9341A/H-REF 200-1480 SEC

WALL COEFF. - I/I-REF.



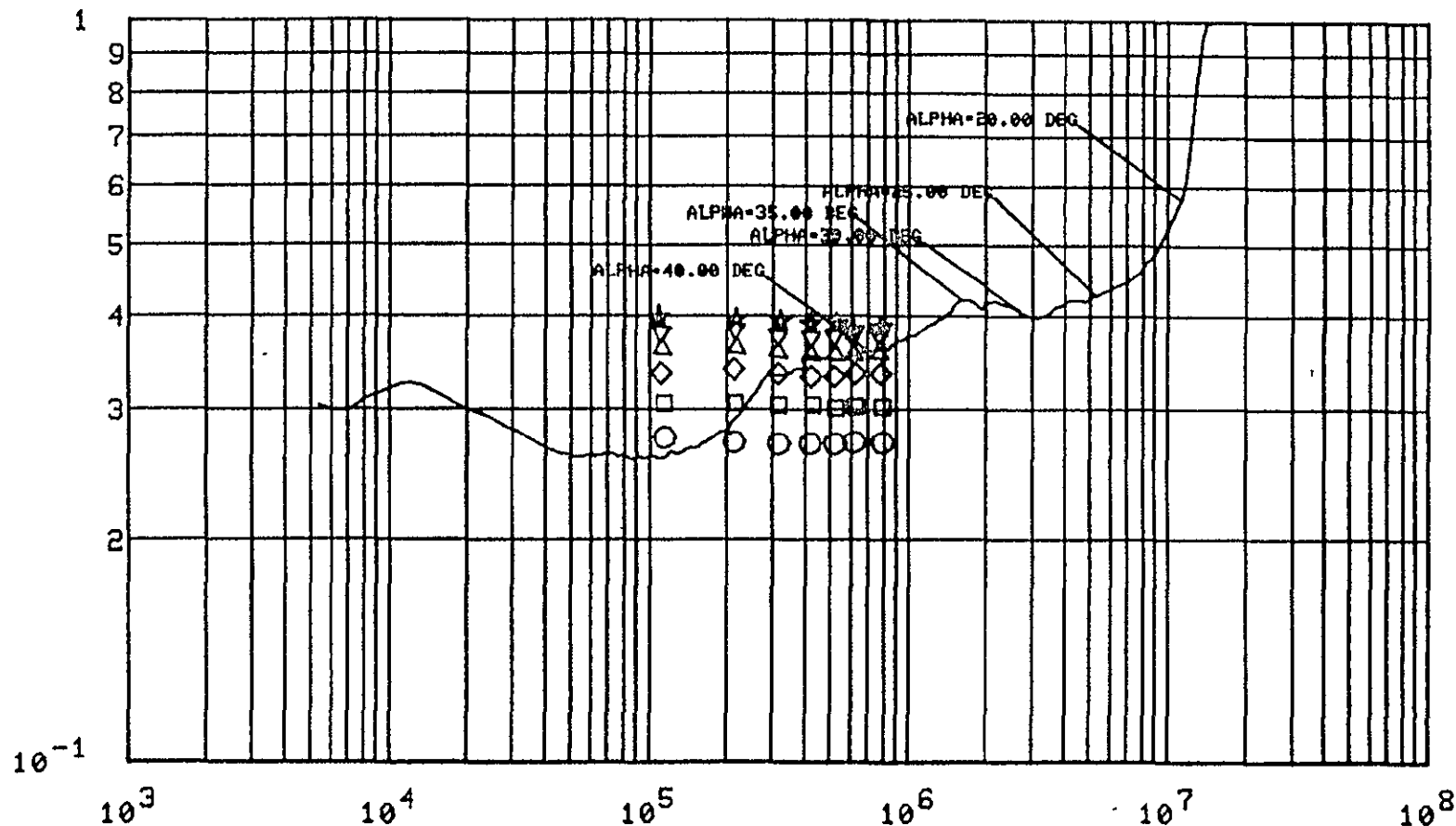
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# STS-3 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

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REYNOLDS NUMBER (NS)

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WAVE COEFF - H/I-0.000

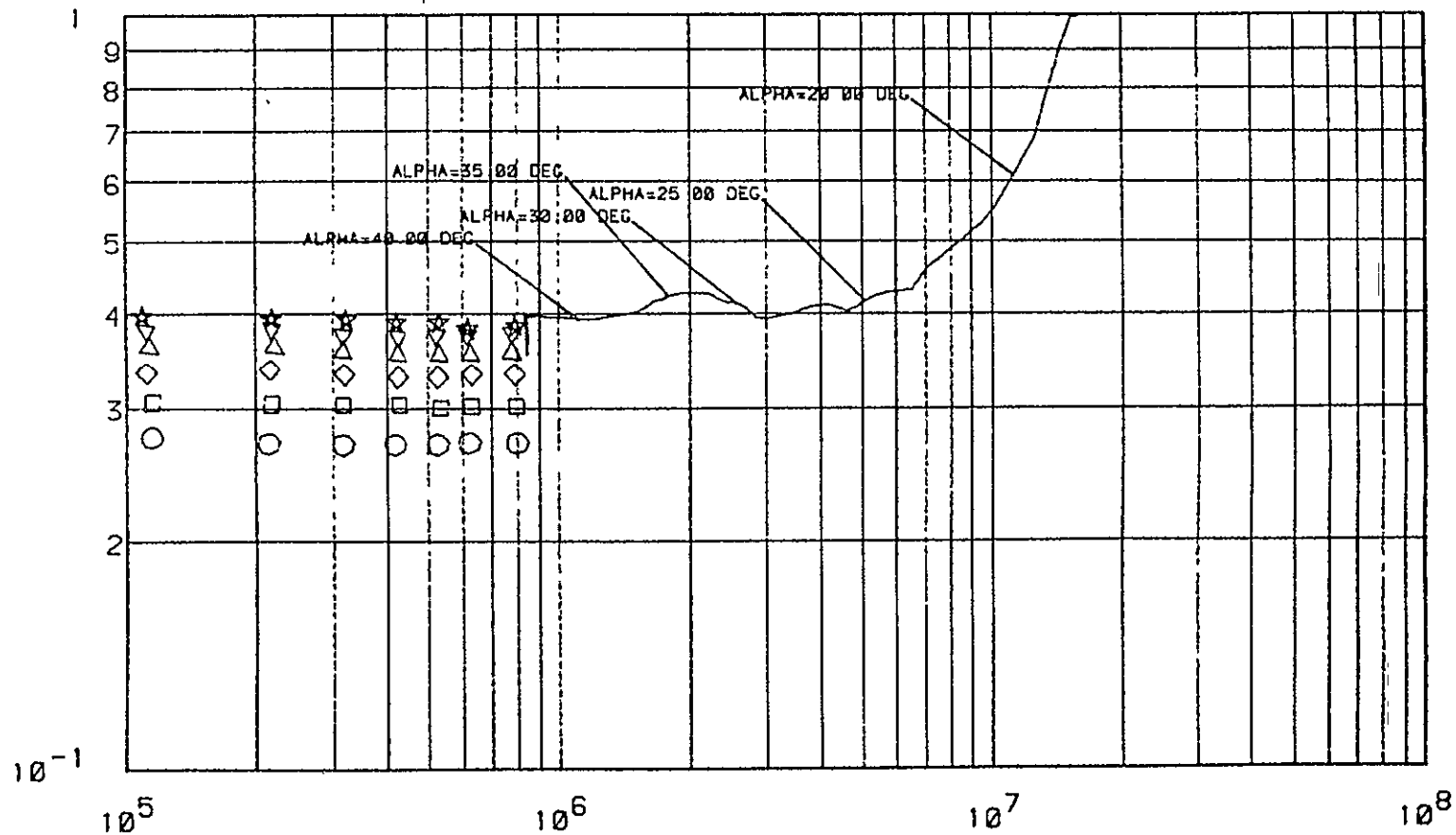
B-13

# STS-4 (107 FT LENGTH CL X/L=0.026) FLIGHT PARAMETER COMPARIS

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OH40 ALPHA = 20 DEGREES  
OH40 ALPHA = 25 DEGREES  
OH40 ALPHA = 30 DEGREES  
OH40 ALPHA = 35 DEGREES  
OH40 ALPHA = 40 DEGREES  
OH40 ALPHA = 45 DEGREES

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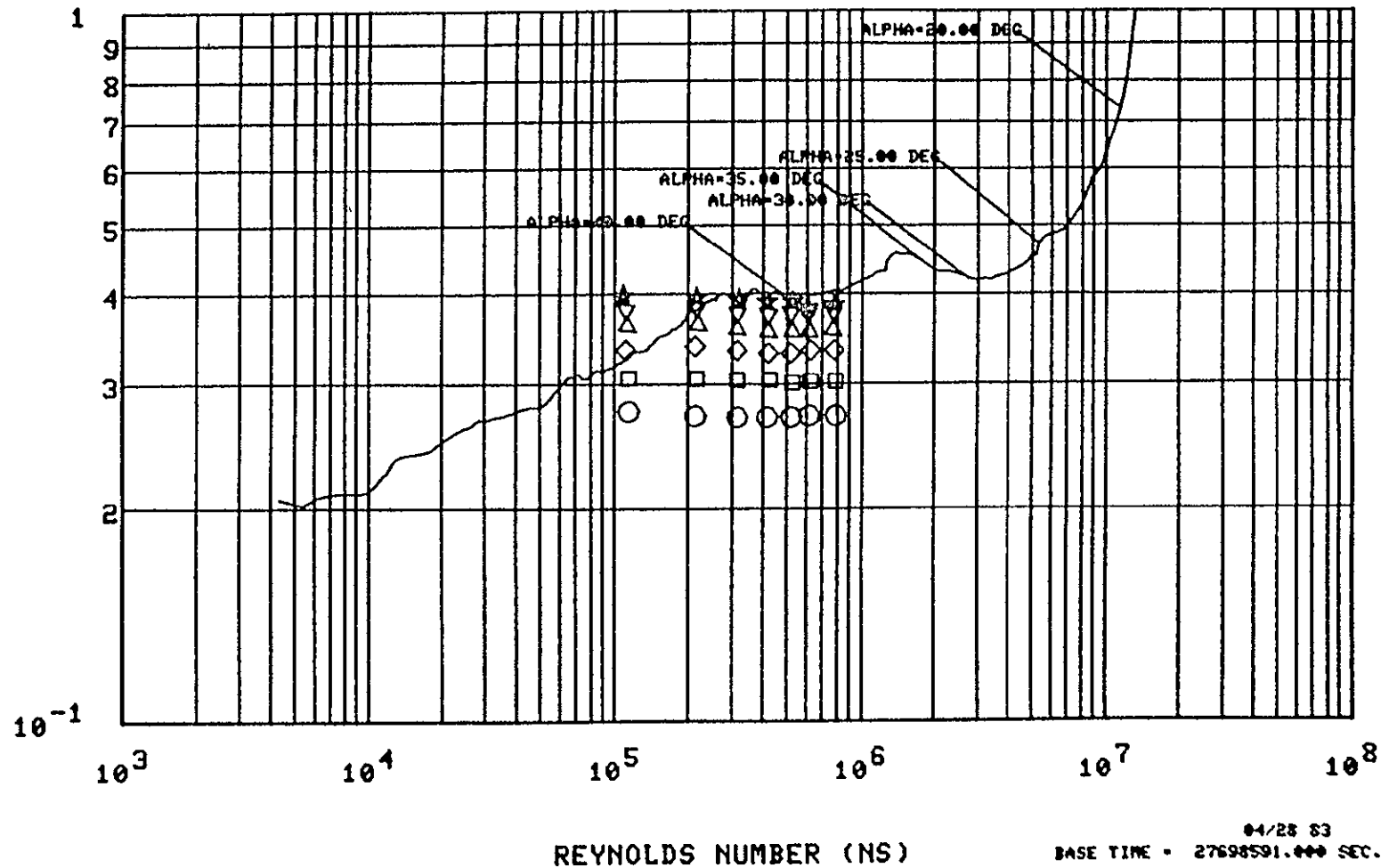
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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
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U09T9341A/H-REF 150-1350 SEC

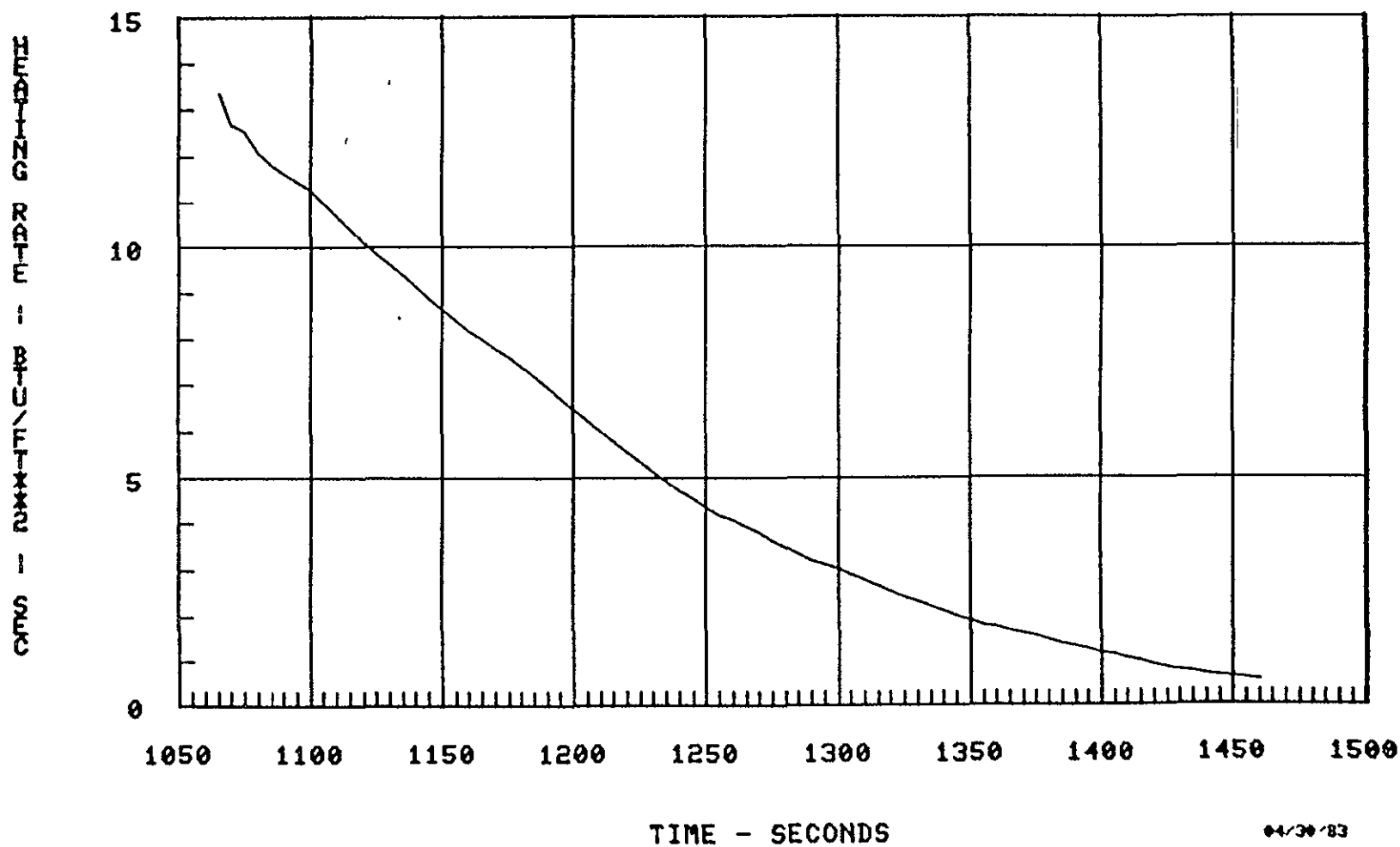
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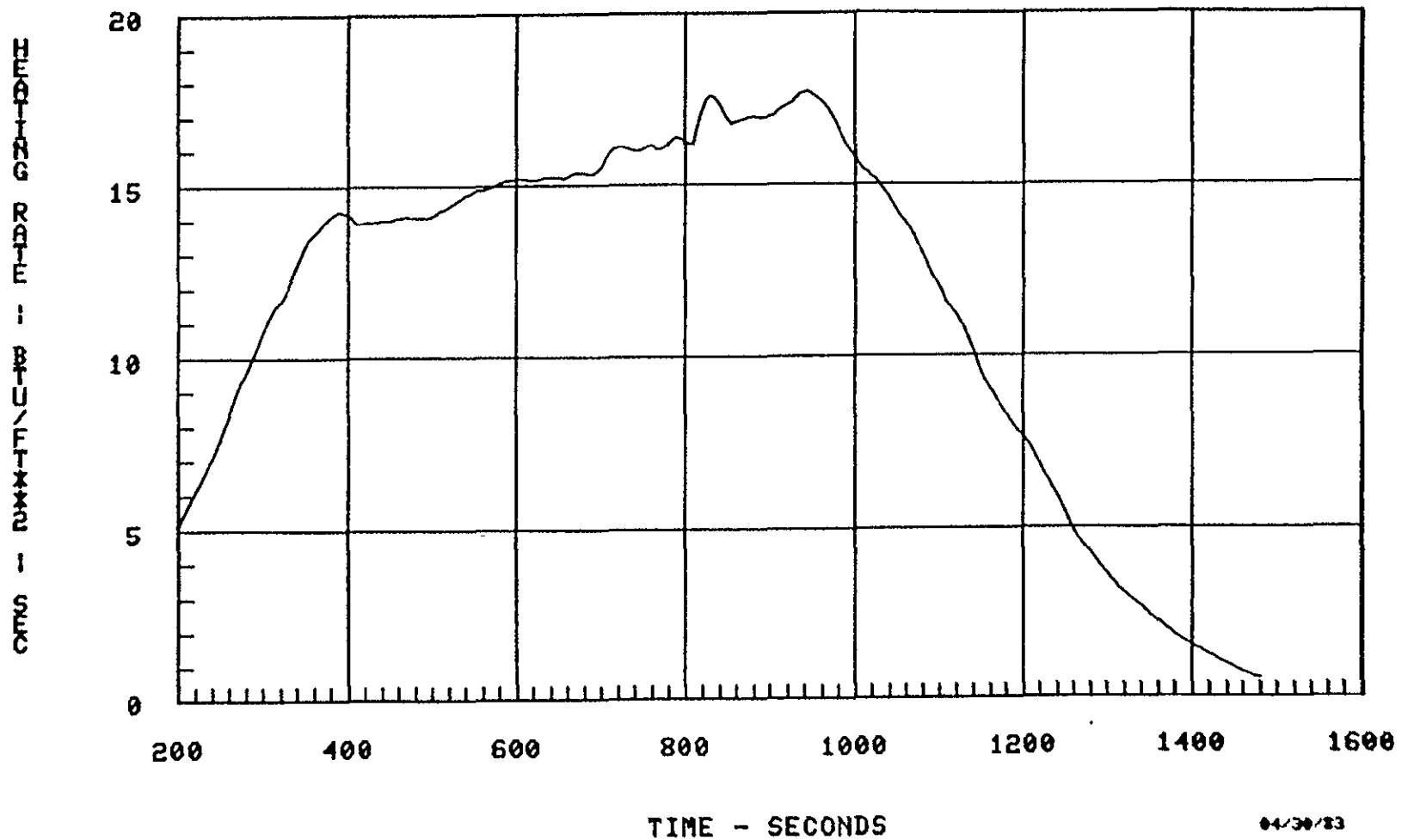


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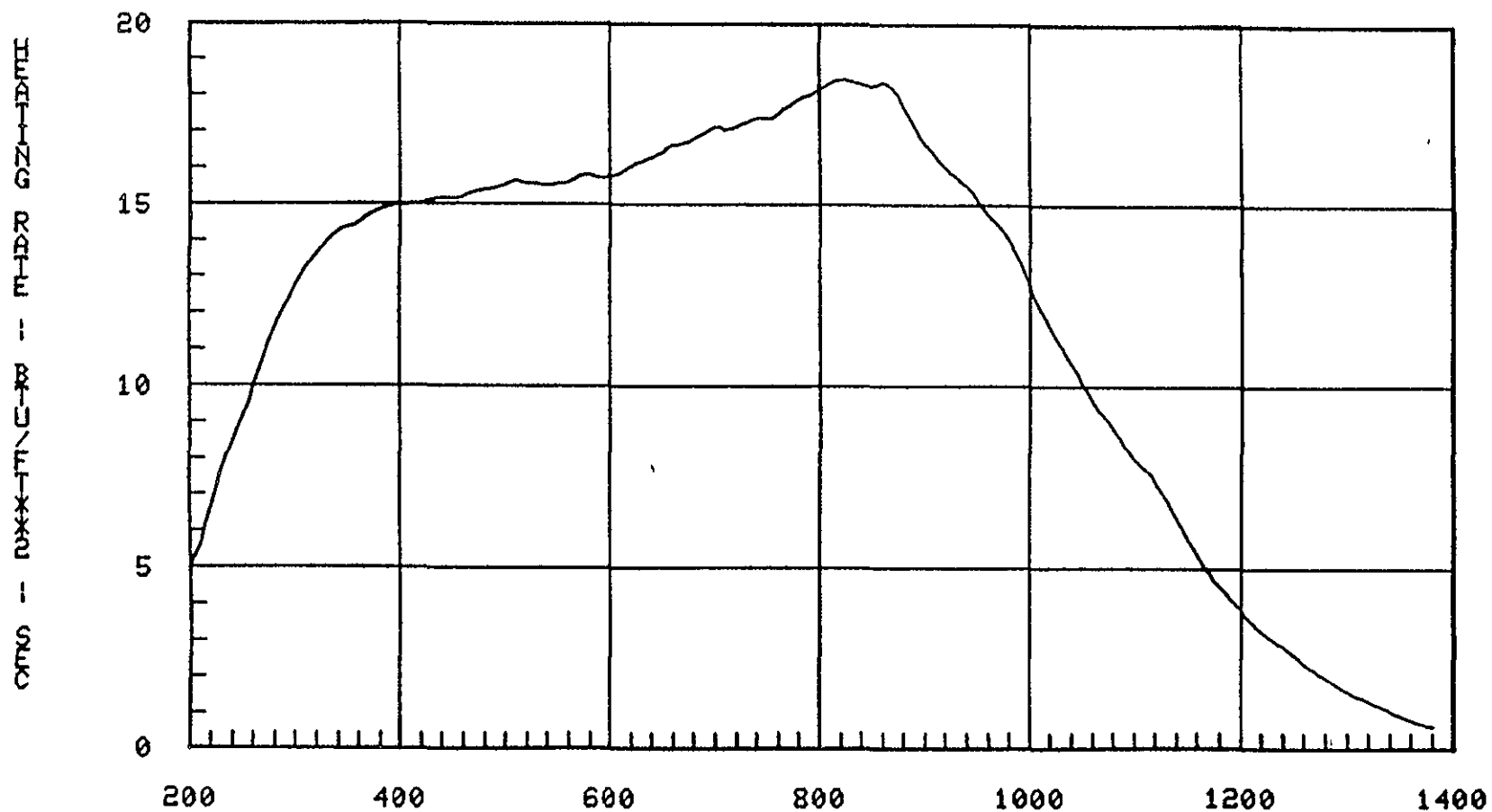
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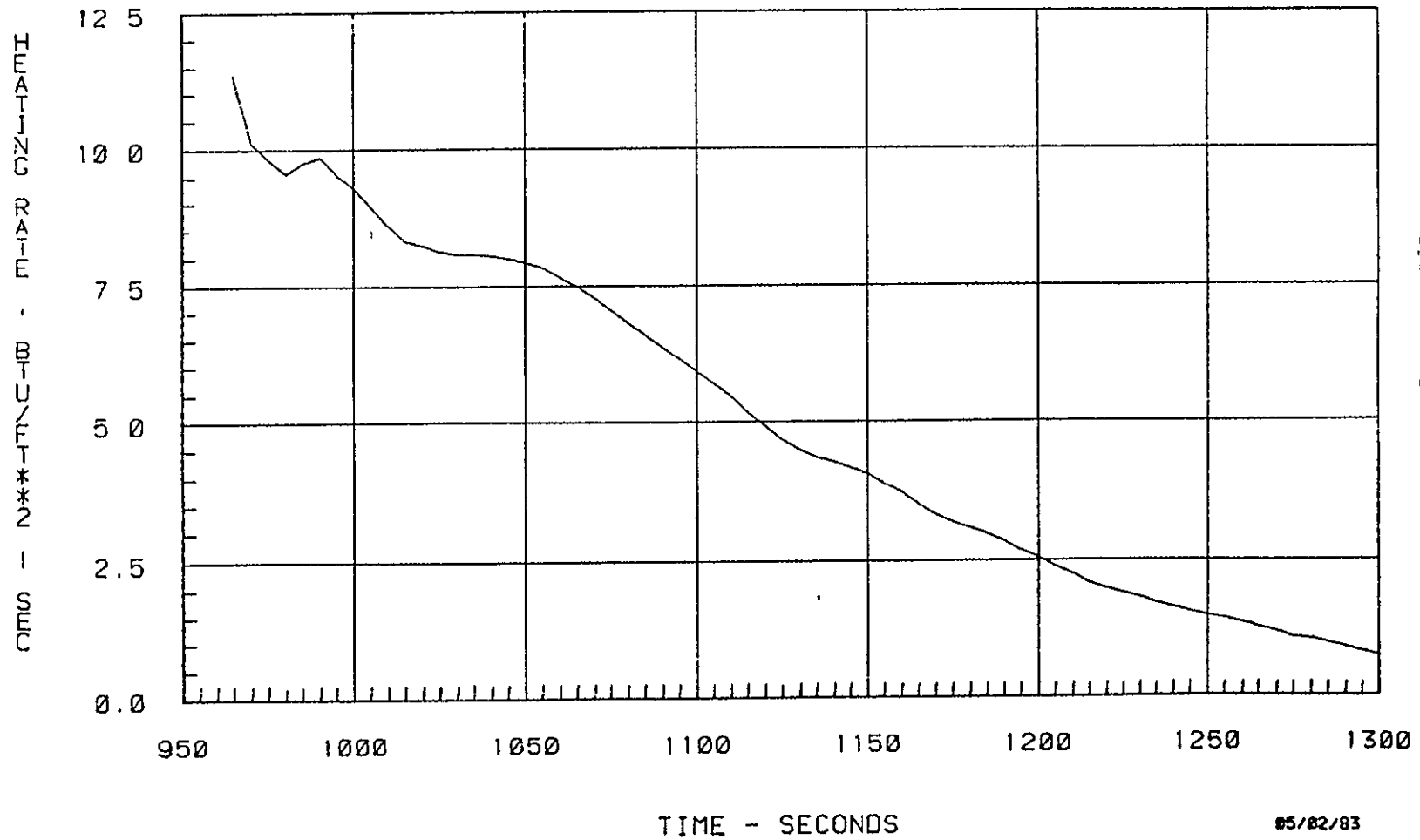
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04/30/83

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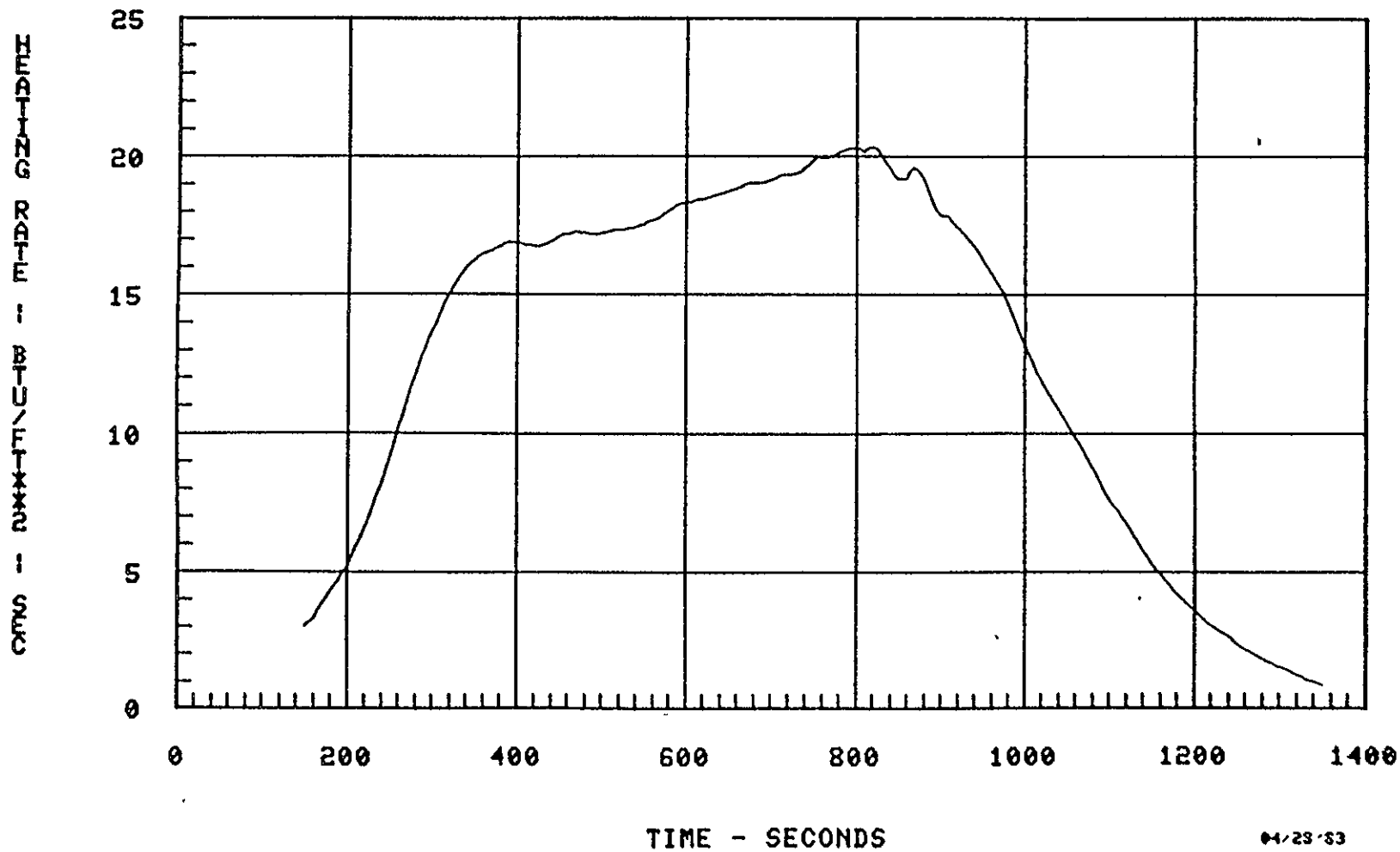
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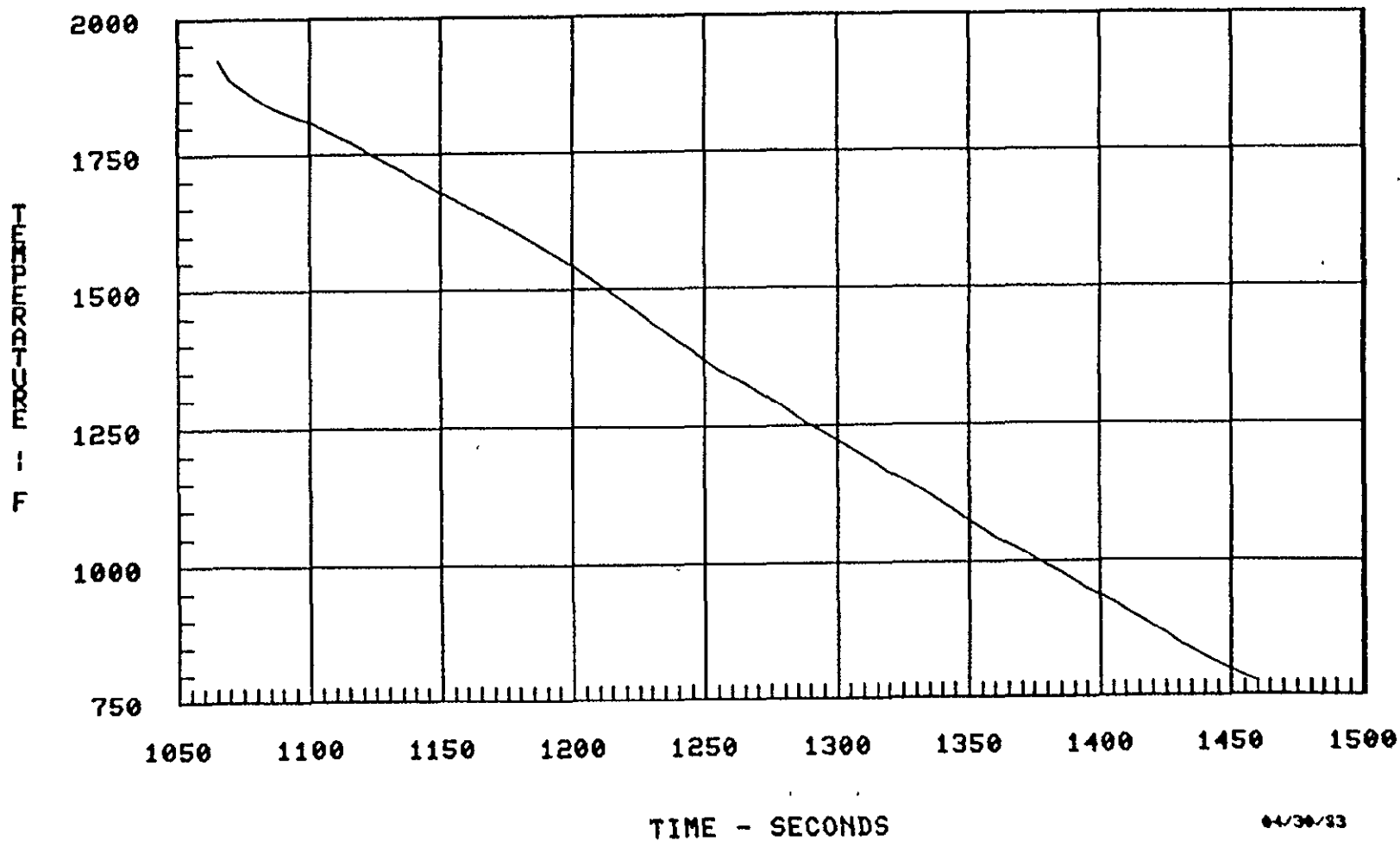


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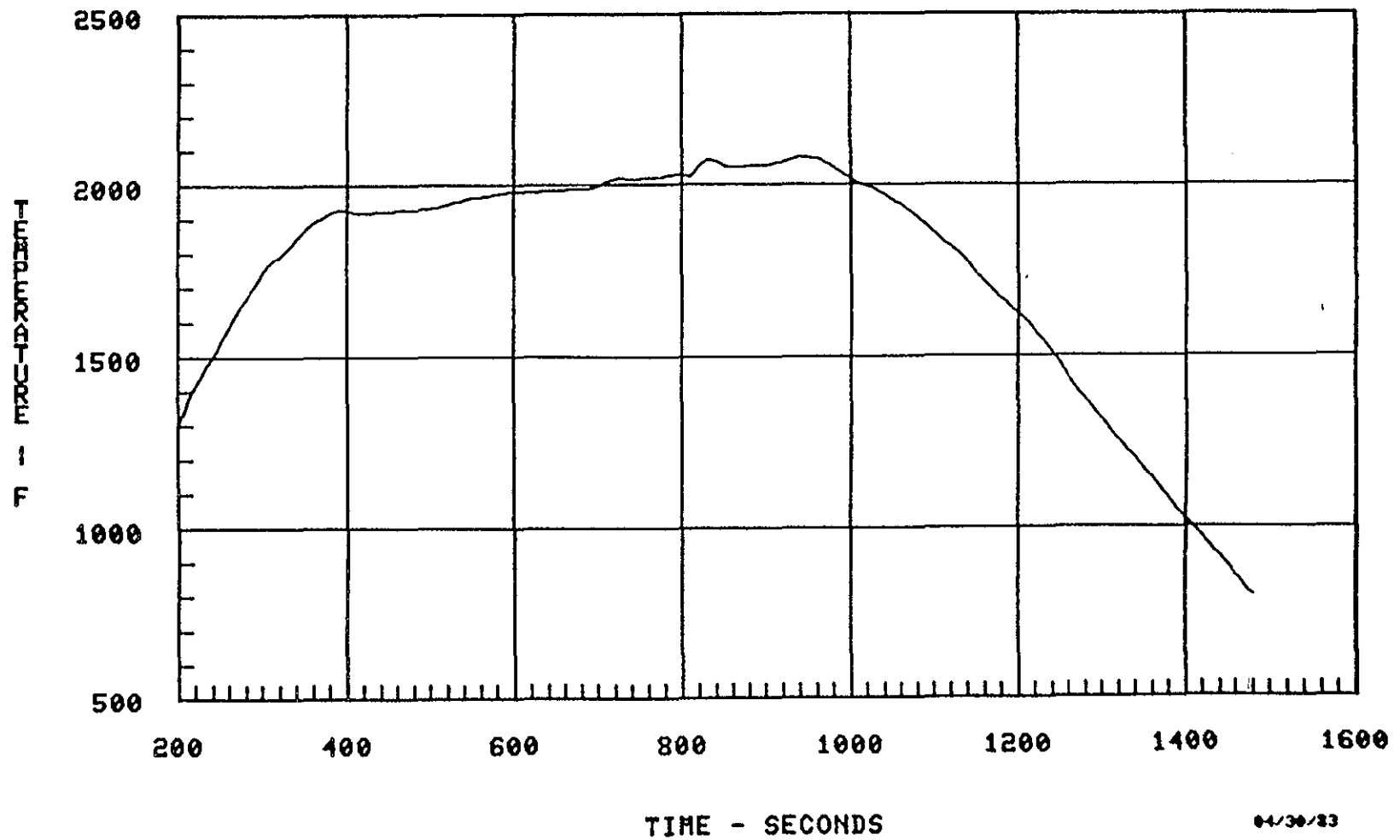
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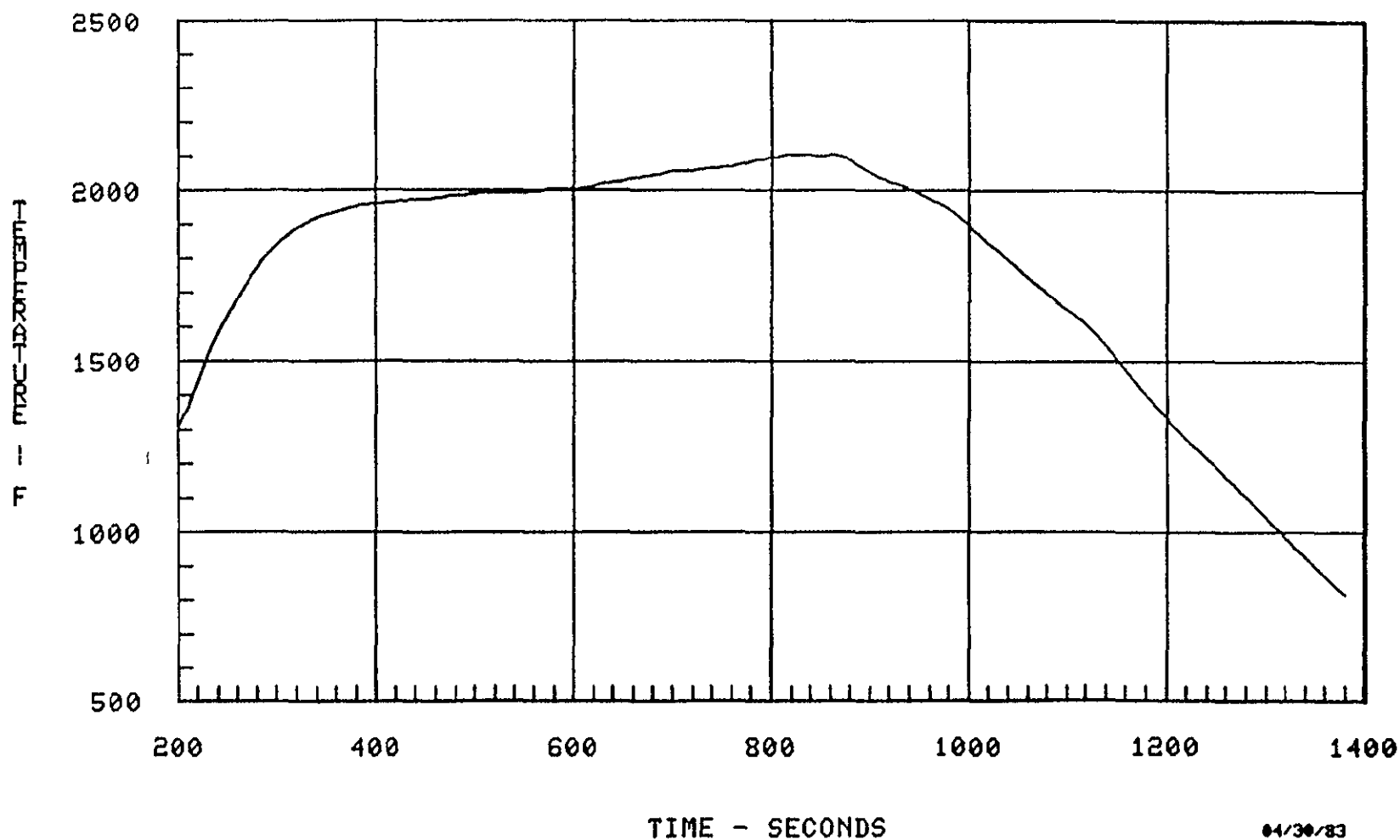
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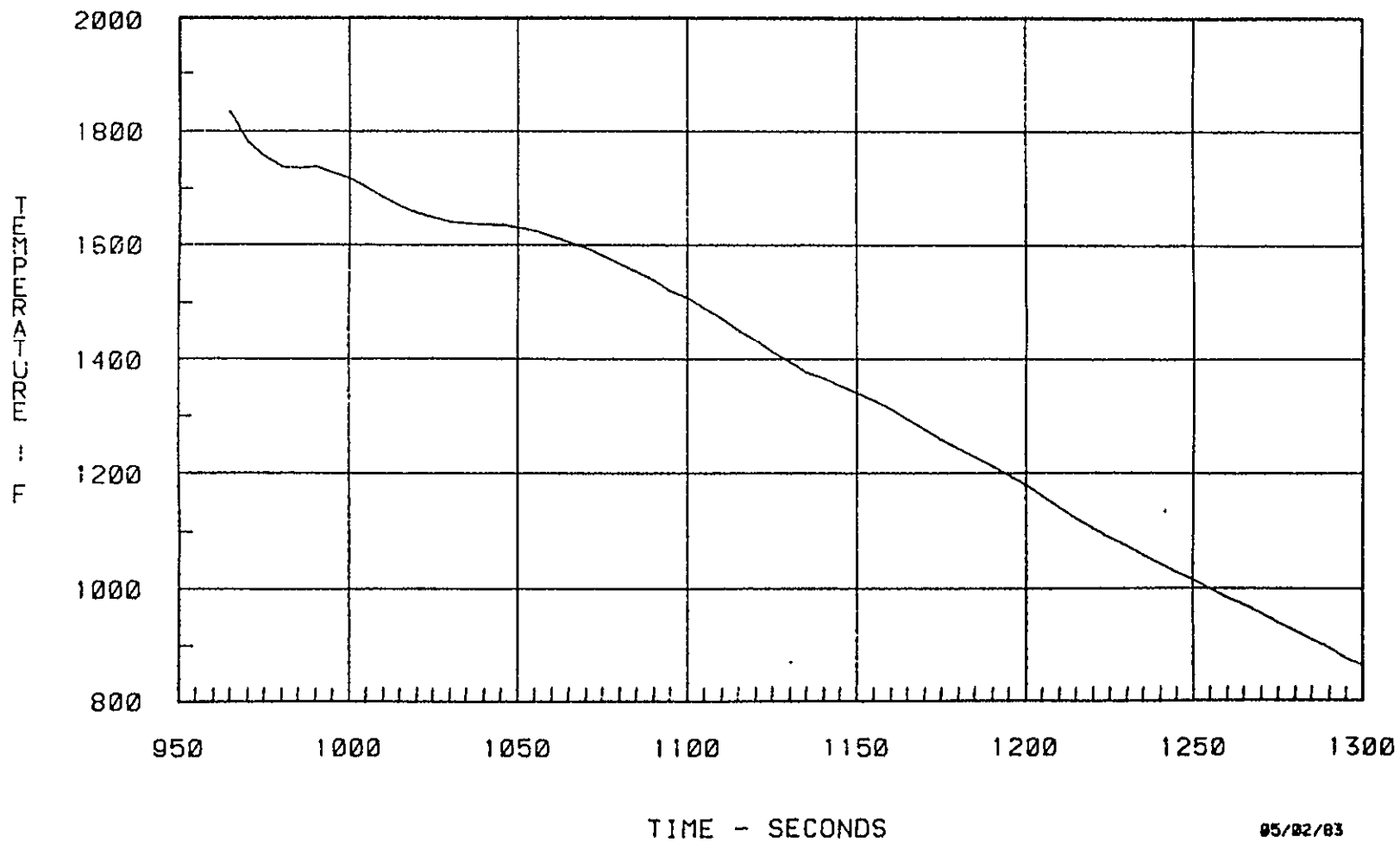
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# STS-4 (107 FT LENGTH CL $X/L=0.026$ ) FLIGHT PARAMETER COMPARIS

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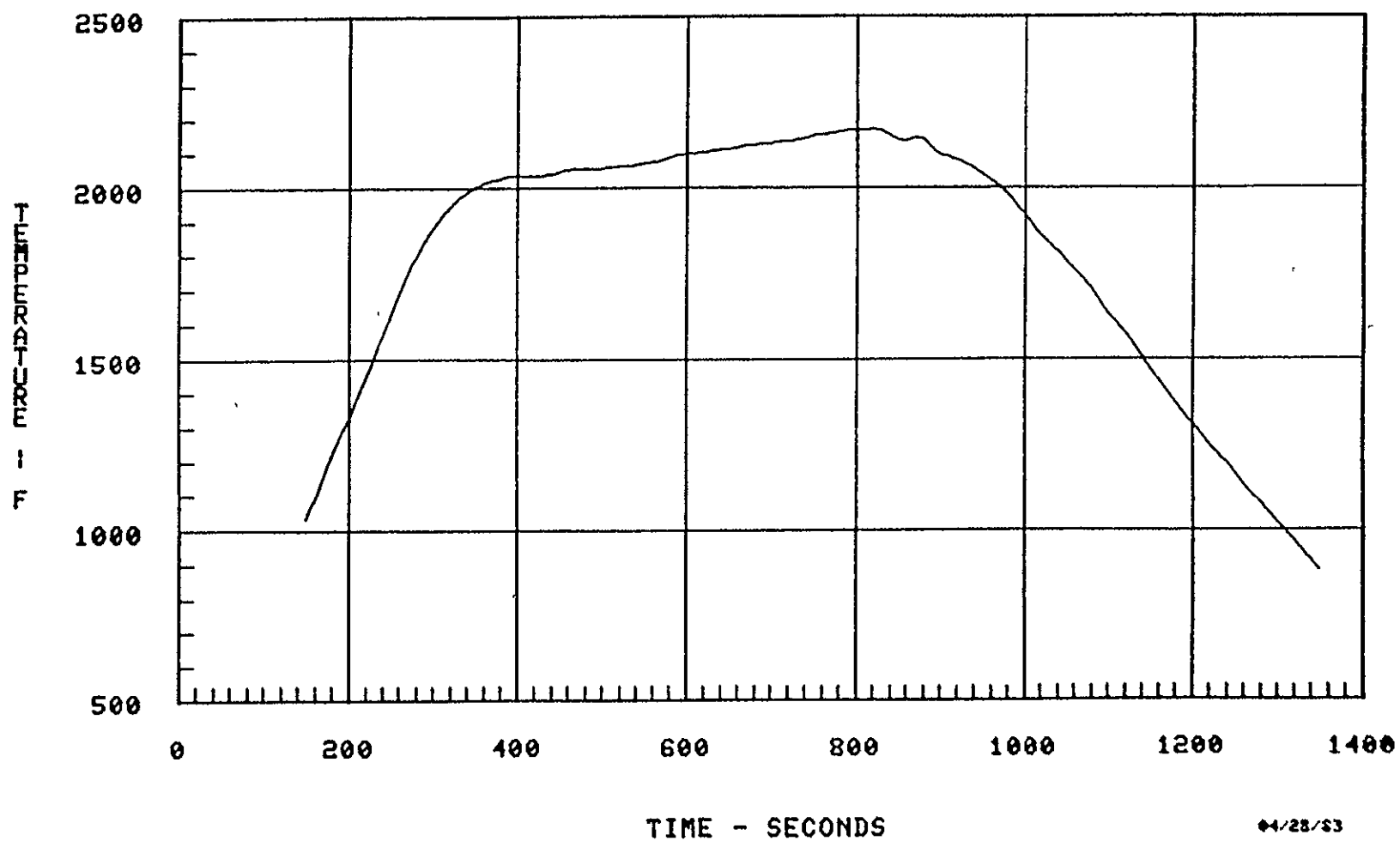


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# STS-5 (107 FT LENGTH CL $X/L=0.026$ ) FLIGHT PARAMETER COMPARIS

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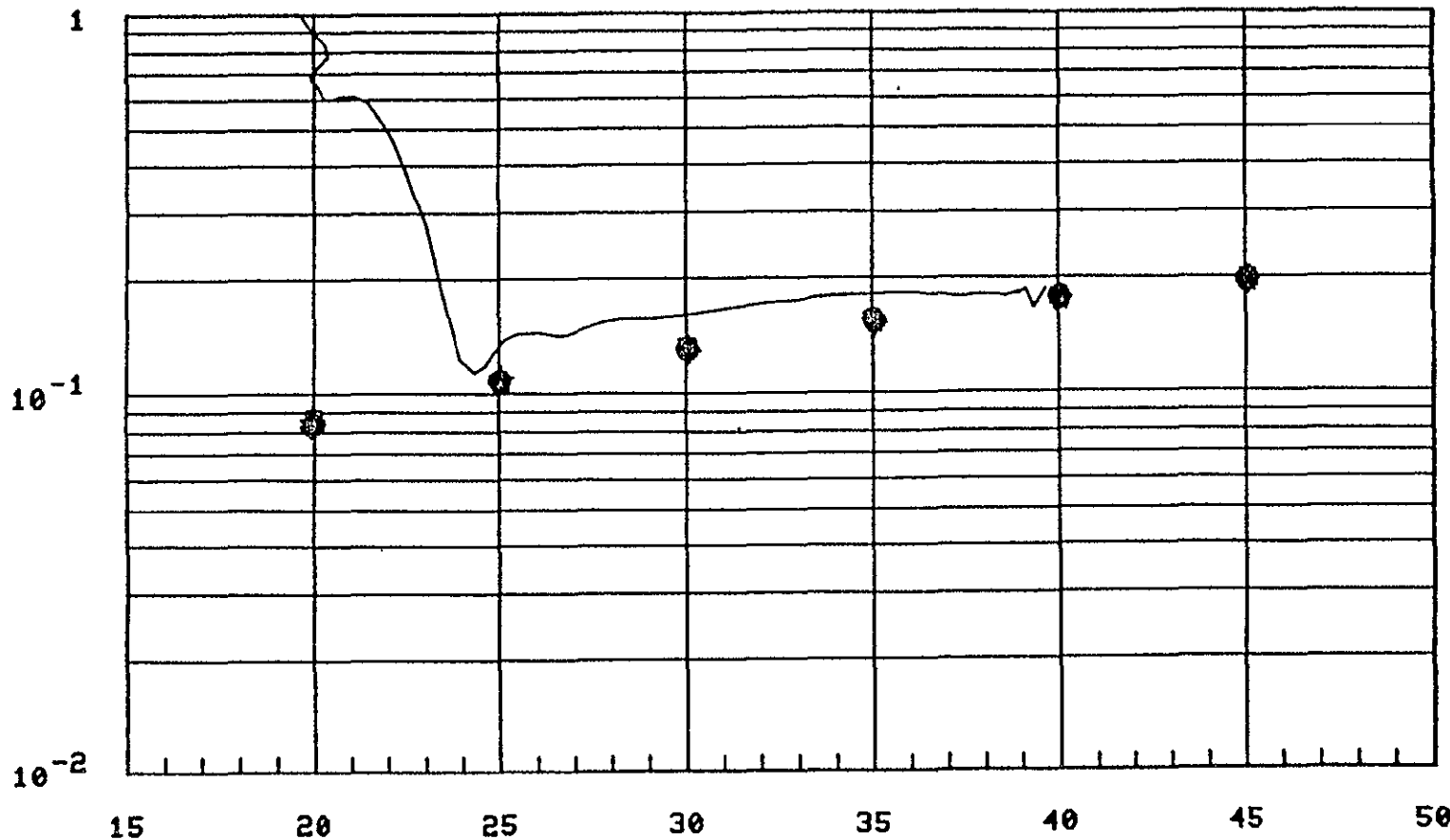
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OH49 0.0175 SCALE RE • 0.5 E06  
OH49 0.0175 SCALE RE • 1.0 E06  
OH49 0.0175 SCALE RE • 1.5 E06  
OH49 0.0175 SCALE RE • 2.0 E06  
OH49 0.0175 SCALE RE • 2.5 E06  
OH49 0.0175 SCALE RE • 3.0 E06  
OH49 0.0175 SCALE RE • 3.7 E06

U07T9452A/H-REF 1065-1460 SEC

WAKE COEFF - I/I-0.001



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ANGLE-OF-ATTACK - DEG

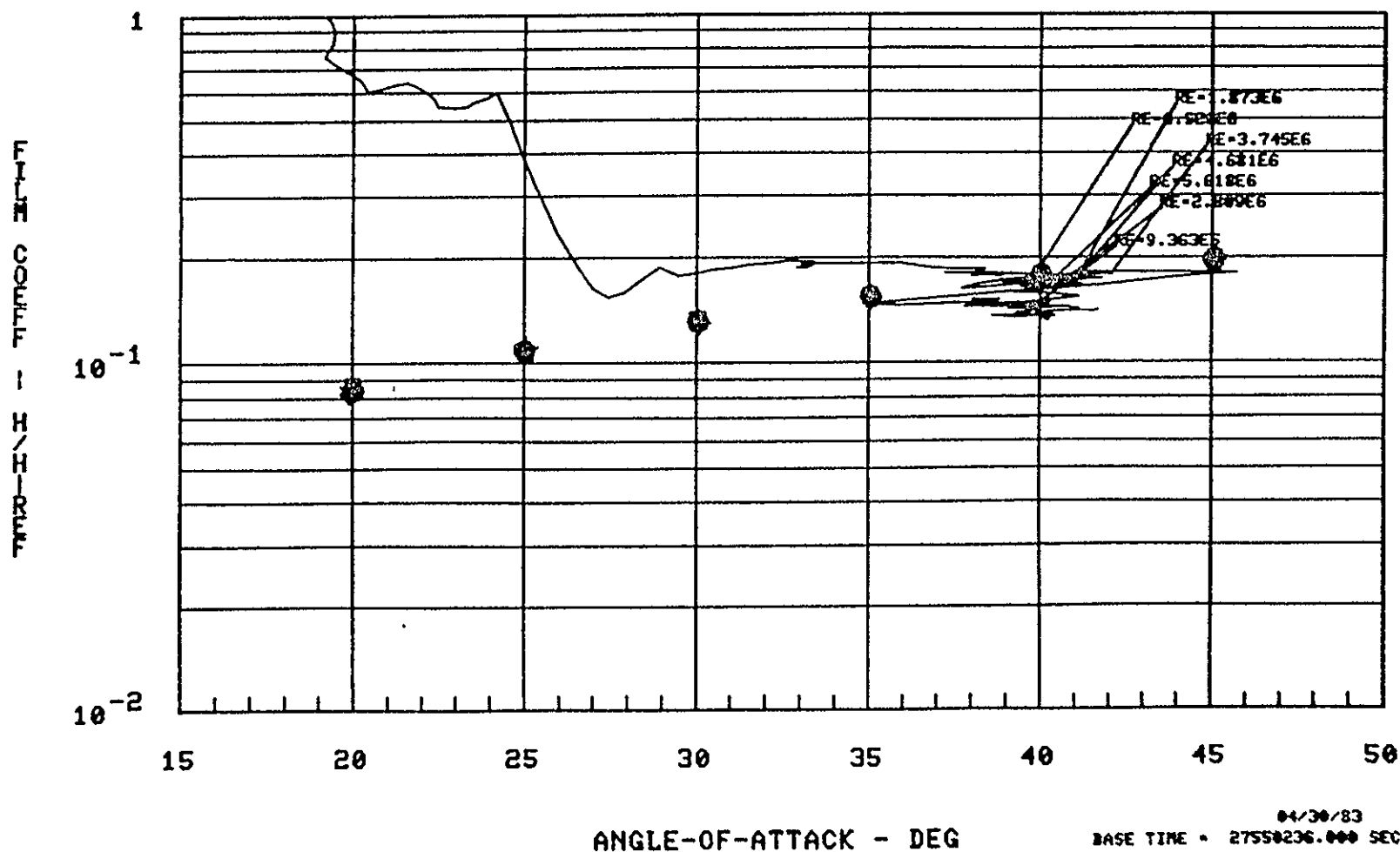
04/30/83  
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# STS-2 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
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OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
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OH49 0.0175 SCALE RE = 3.7 E06

U07T9452A/H-REF 200-1480 SEC



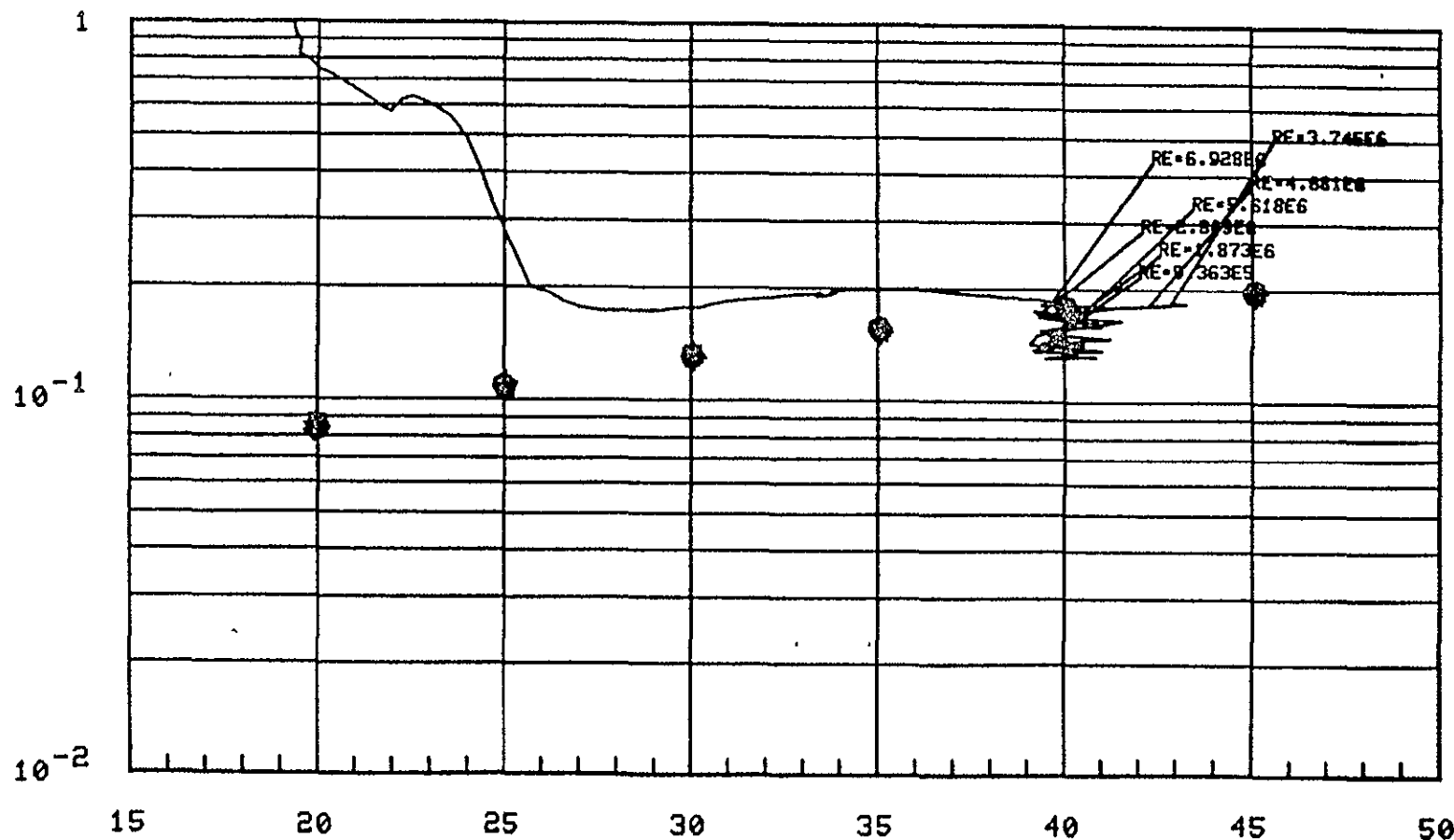
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# STS-3 (107 FT LENGTH CL $Y/L=0.10$ ) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9452A/H-REF 200-1380 SEC



LIFT COEFF - I/I-0200

ANGLE-OF-ATTACK - DEG

04/30/83  
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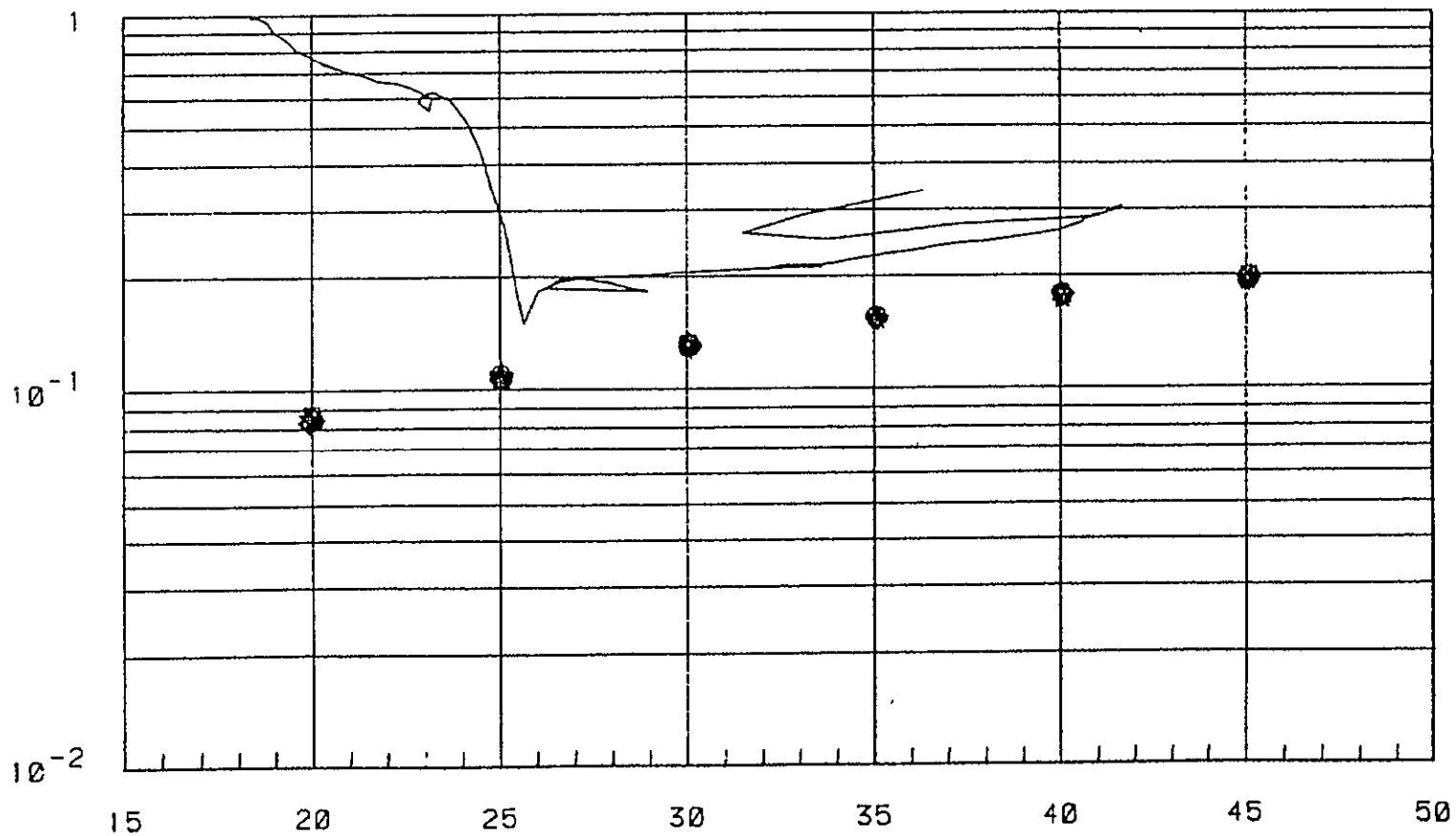
# STS-4 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

V07T9452A/H-REF 065-1300 SEC

LINE COEFF - INT-COEFF



ANGLE-OF-ATTACK - DEG

05/02/83  
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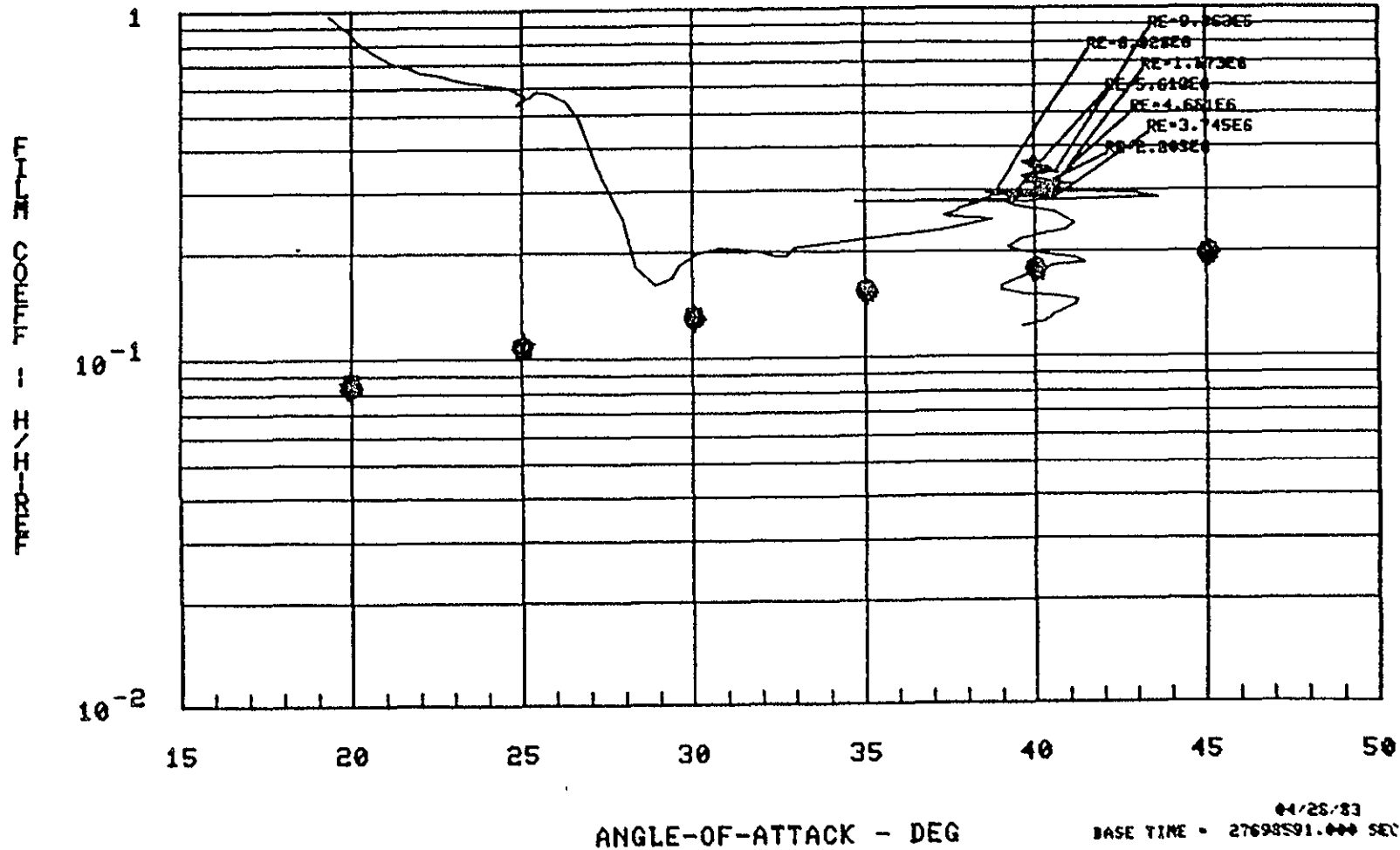
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# STS-5 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

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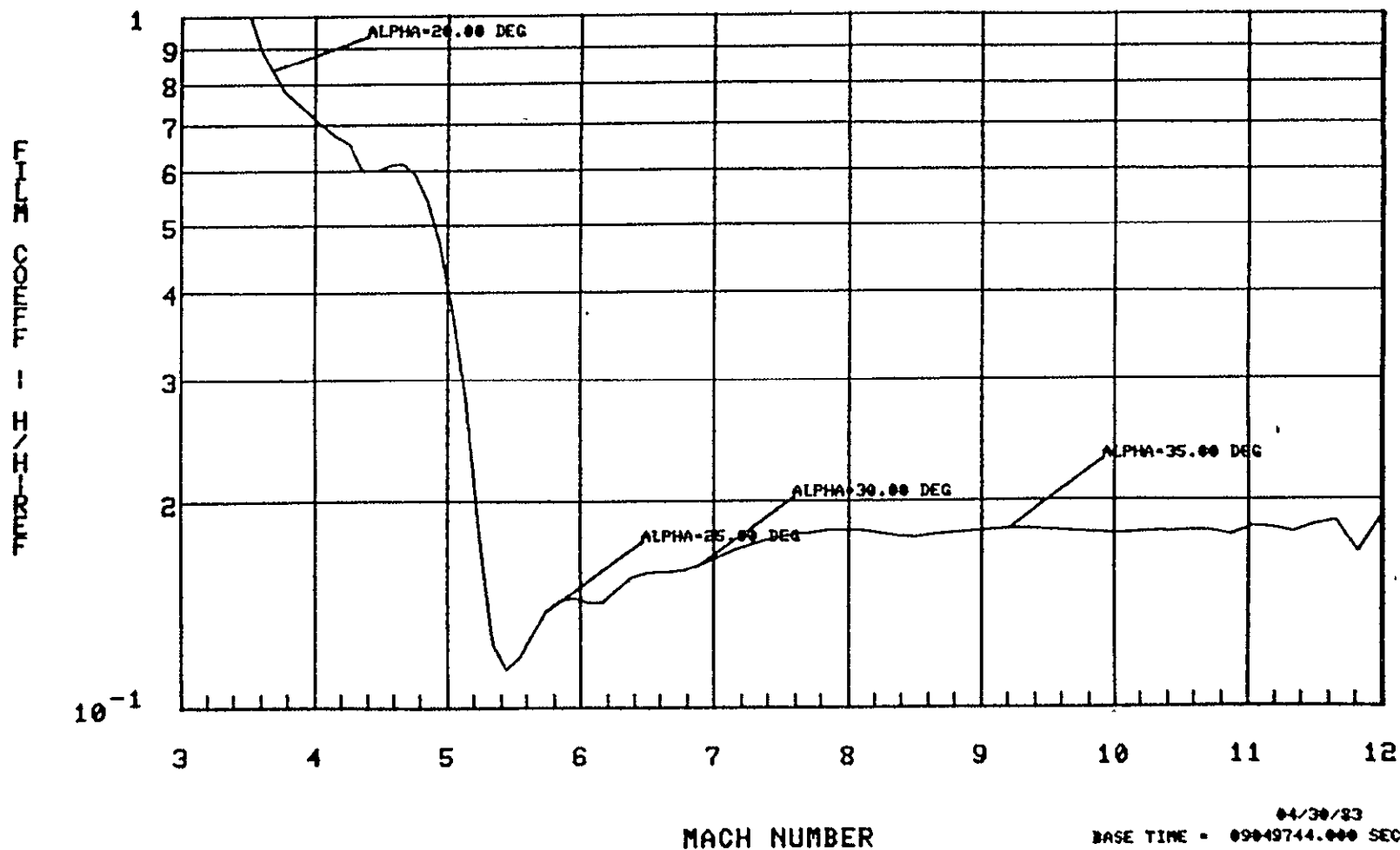
OH49 0.0175 SCALE RE \* 0.5 E06  
OH49 0.0175 SCALE RE \* 1.0 E06  
OH49 0.0175 SCALE RE \* 1.5 E06  
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OH49 0.0175 SCALE RE \* 2.5 E06  
OH49 0.0175 SCALE RE \* 3.0 E06  
OH49 0.0175 SCALE RE \* 3.7 E06

U07T9452A/H-REF 150-1350 SEC



# STS-1 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

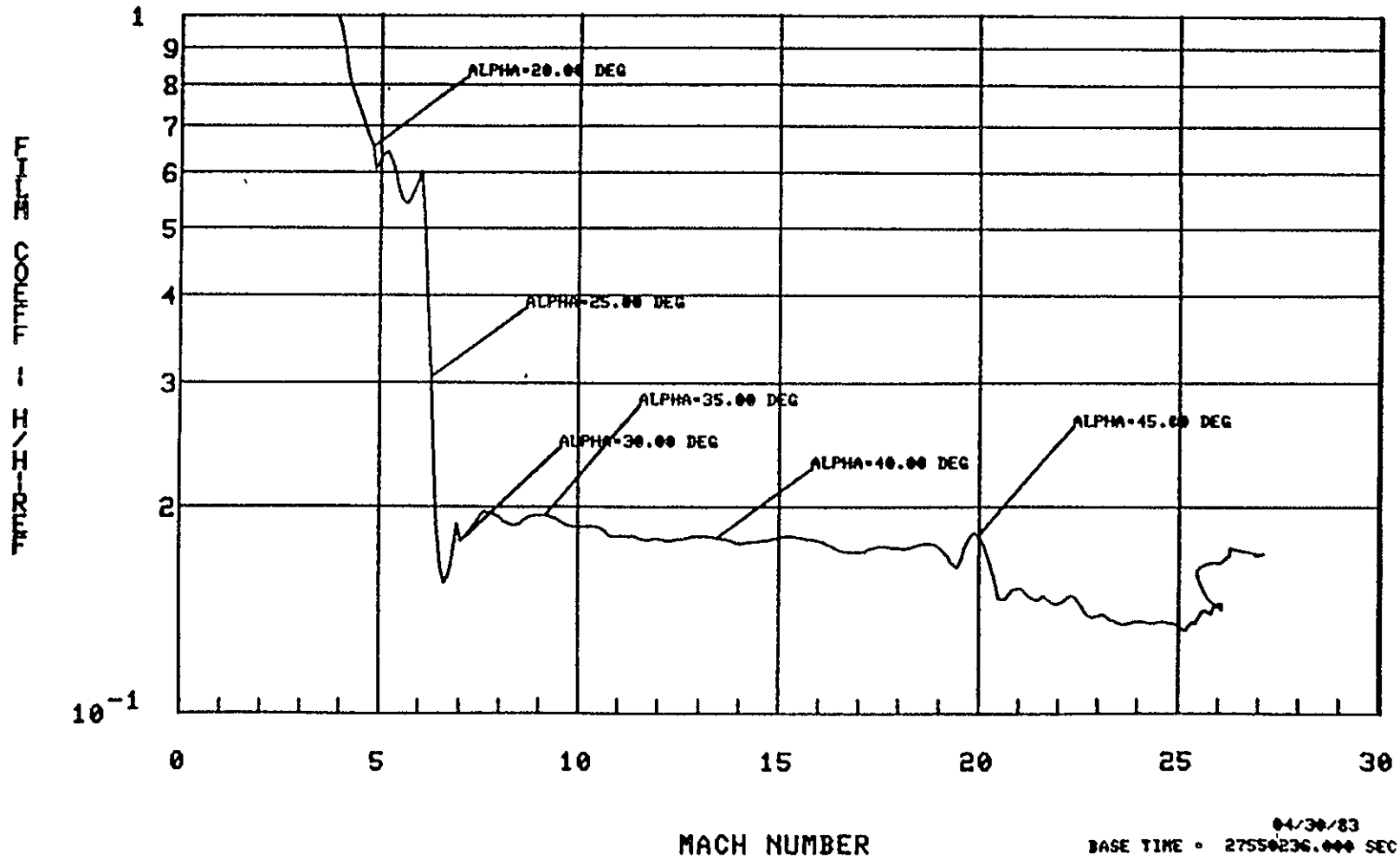
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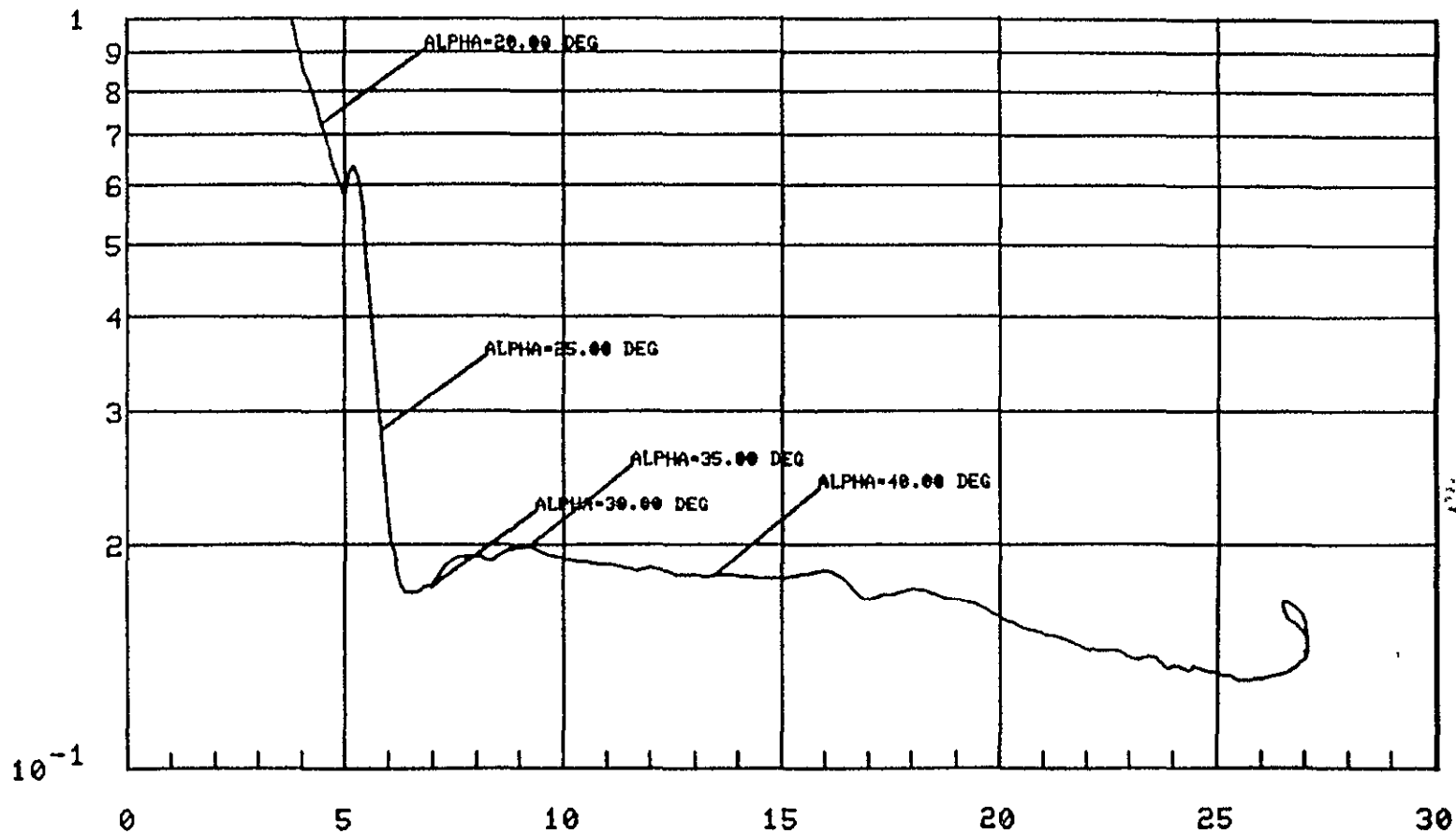


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# STS-3 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

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FILE CONTROL - H/H-0244

B-33

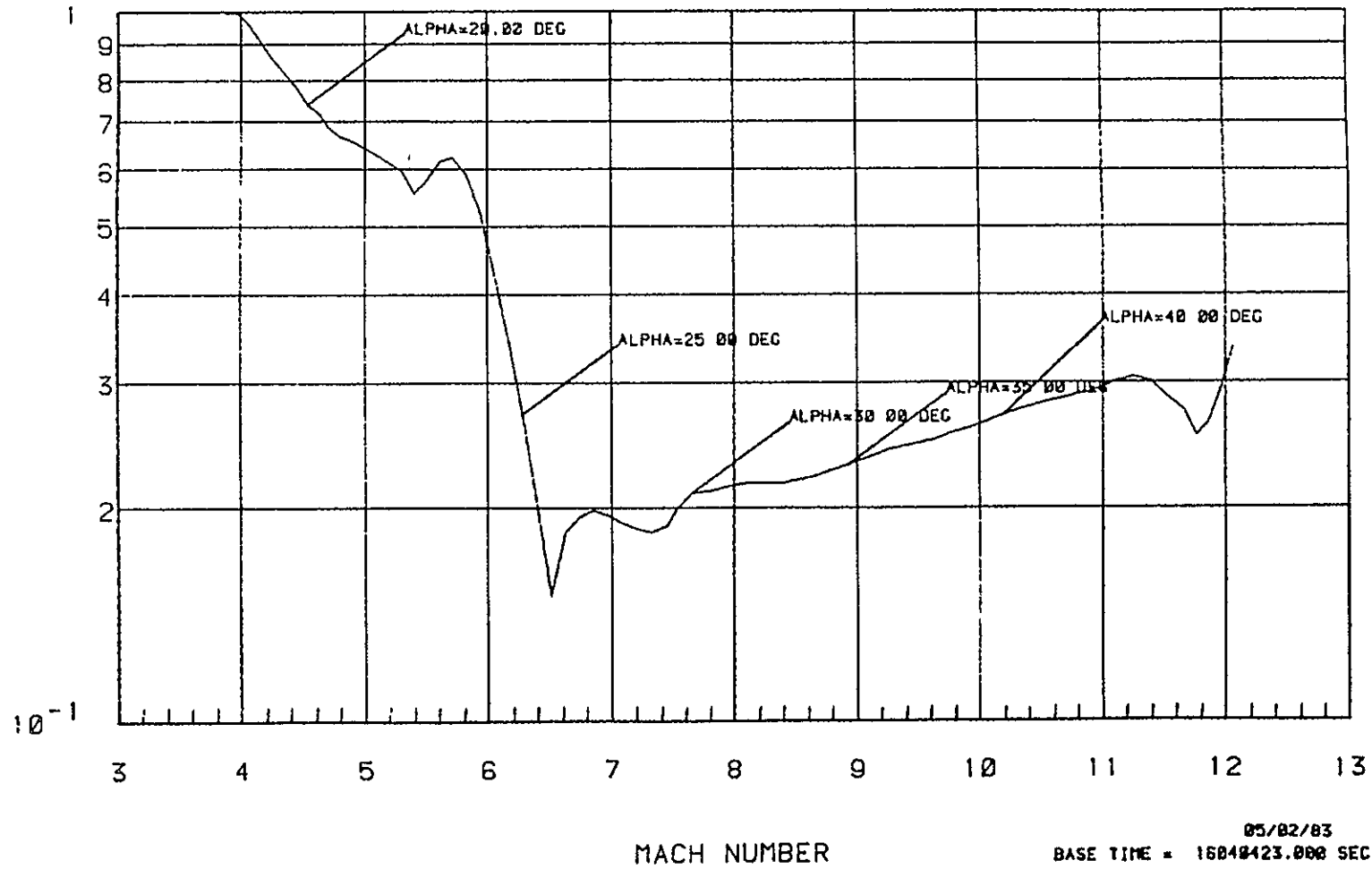
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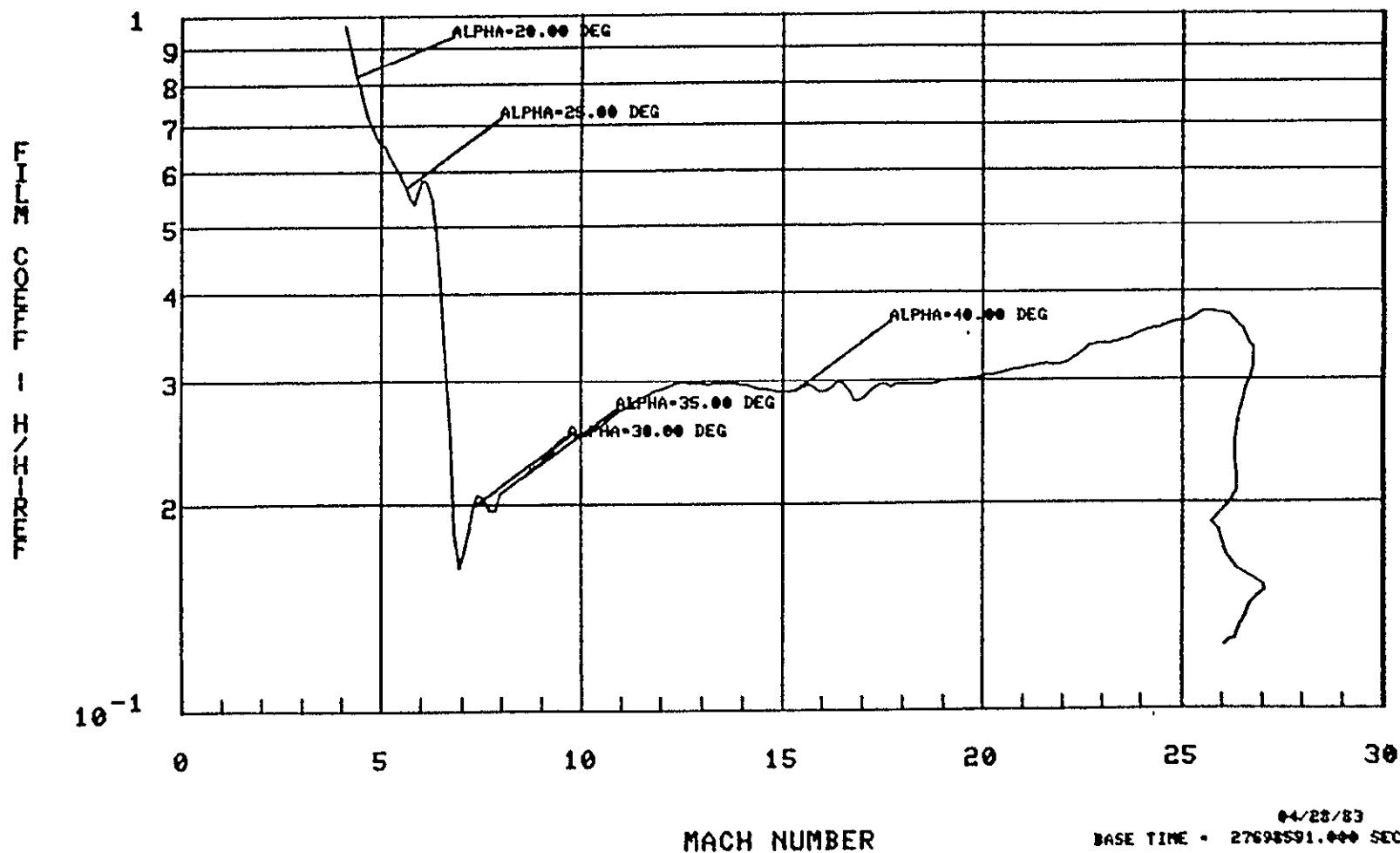
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————— V07T0452A/H-REF 965-1300 SEC



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U07T9452A/H-REF 150-1350 SEC



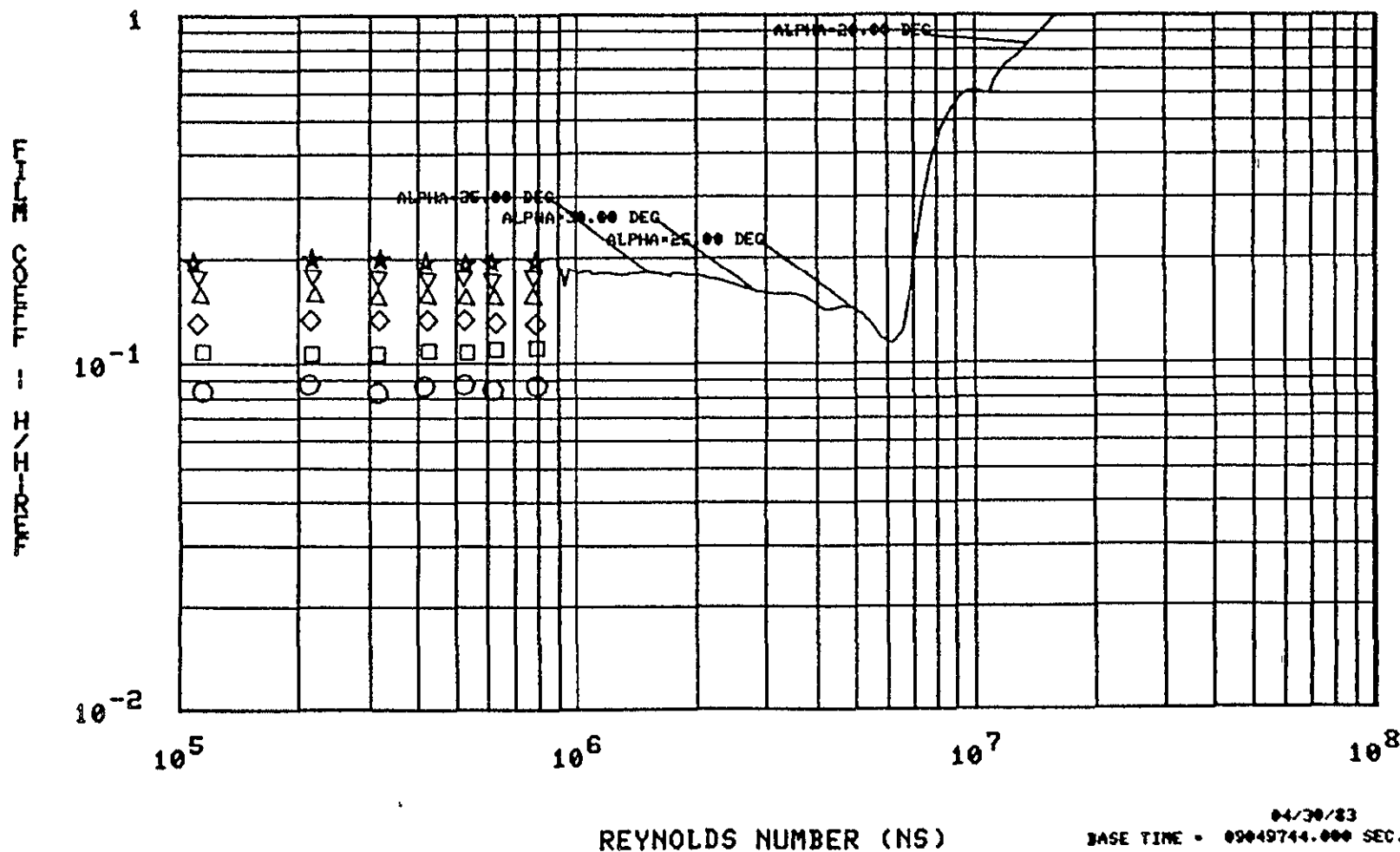
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# STS-1 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

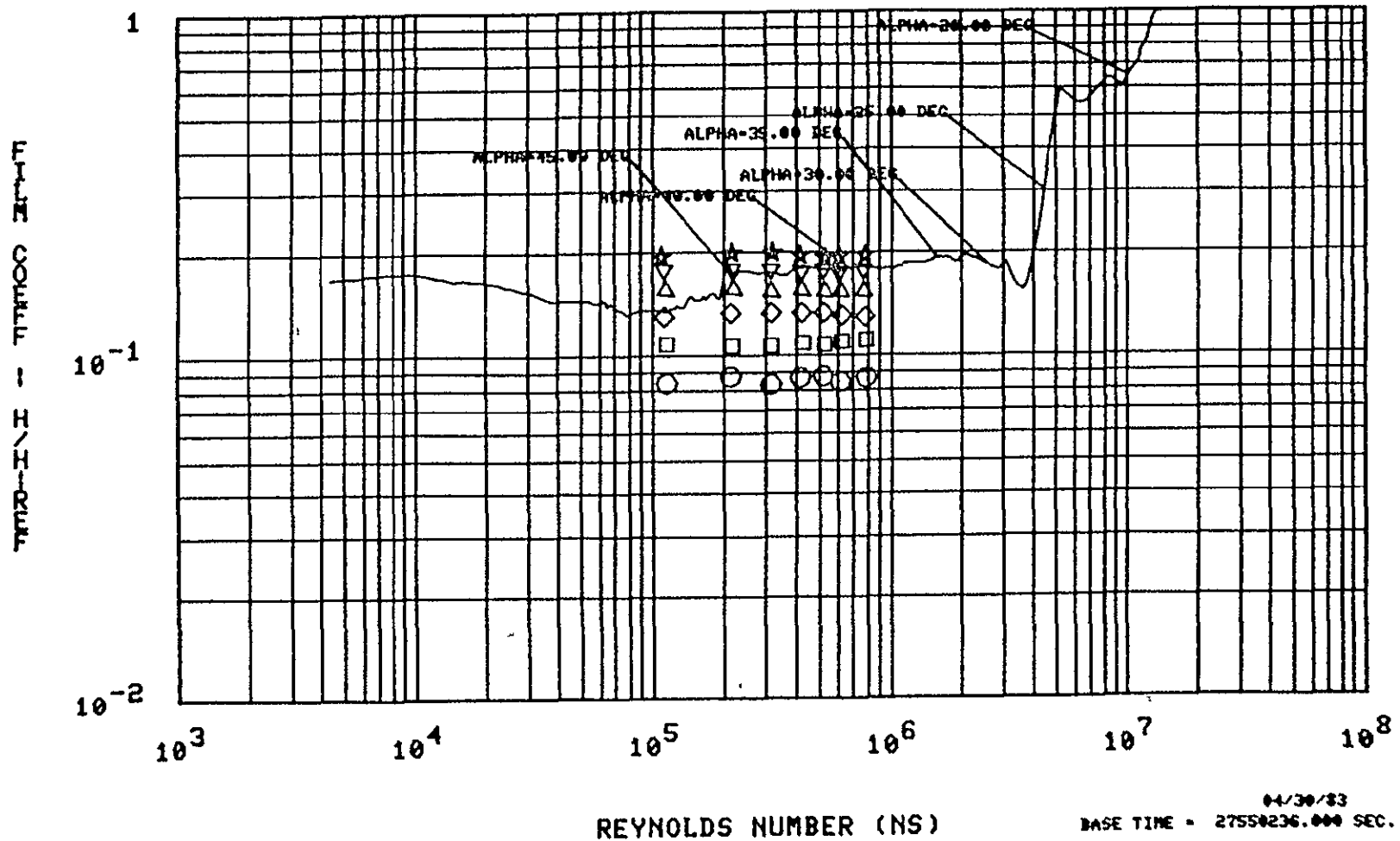
U07T9452A/H-REF 1065-1460 SEC



# STS-2 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

○ OH49 ALPHA = 20 DEGREES  
 □ OH49 ALPHA = 25 DEGREES  
 ◇ OH49 ALPHA = 30 DEGREES  
 △ OH49 ALPHA = 35 DEGREES  
 ▼ OH49 ALPHA = 40 DEGREES  
 ★ OH49 ALPHA = 45 DEGREES

U07T9452A/H-REF 200-1480 SEC

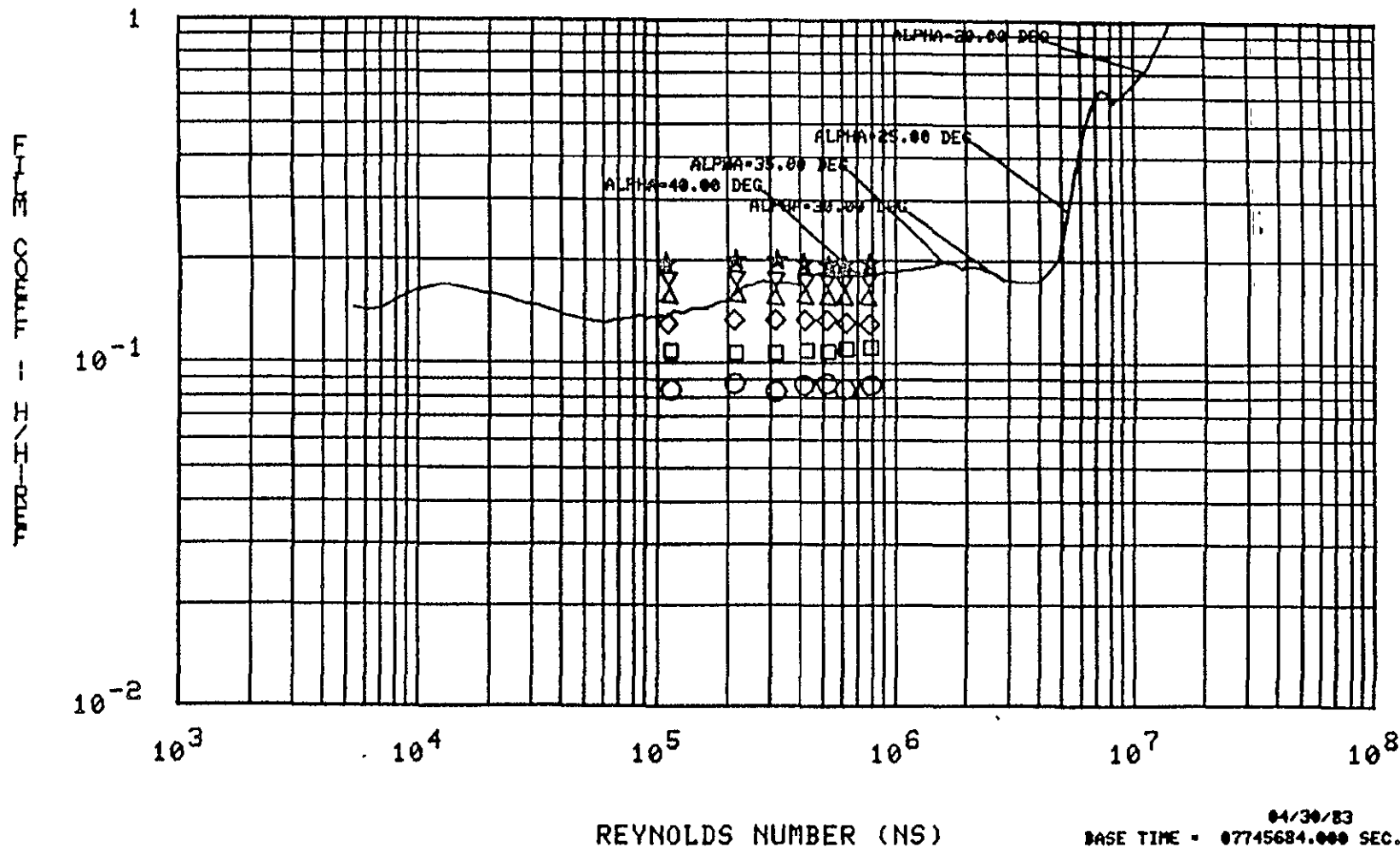


ORIGINAL PAGE IS  
OF POOR QUALITY

# STS-3 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISON

○ 0H49 ALPHA = 20 DEGREES  
 □ 0H49 ALPHA = 25 DEGREES  
 ◇ 0H49 ALPHA = 30 DEGREES  
 △ 0H49 ALPHA = 35 DEGREES  
 ▼ 0H49 ALPHA = 40 DEGREES  
 ★ 0H49 ALPHA = 45 DEGREES

U07T9452A/H-REF 200-1380 SEC



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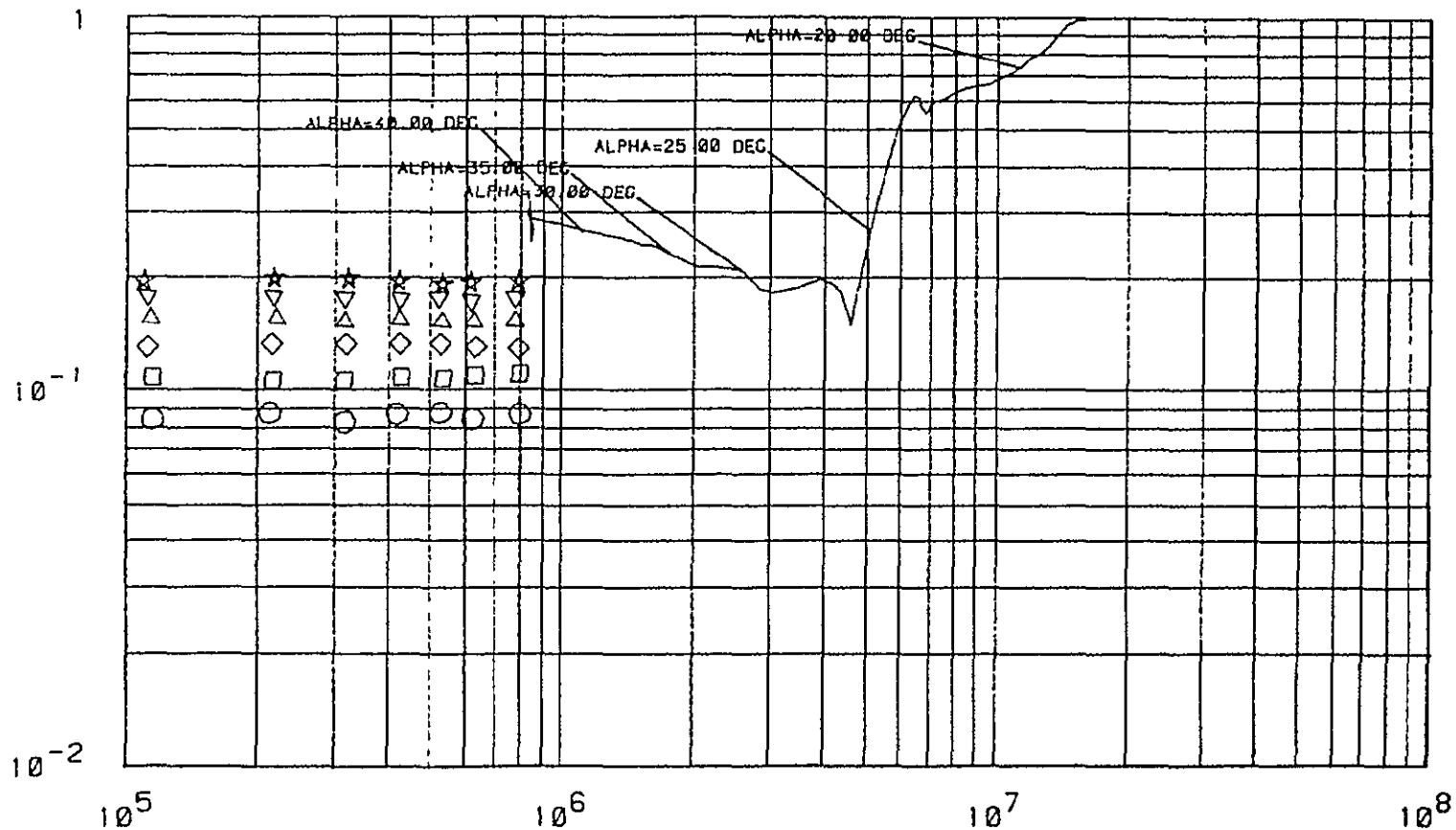
# STS-4 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

V07T0452A/H-REF 065-1300 SEC

WING COEFFICIENT - I/T-CRUI.



REYNOLDS NUMBER (NS)

05/02/83  
BASE TIME = 16040423 000 SEC.

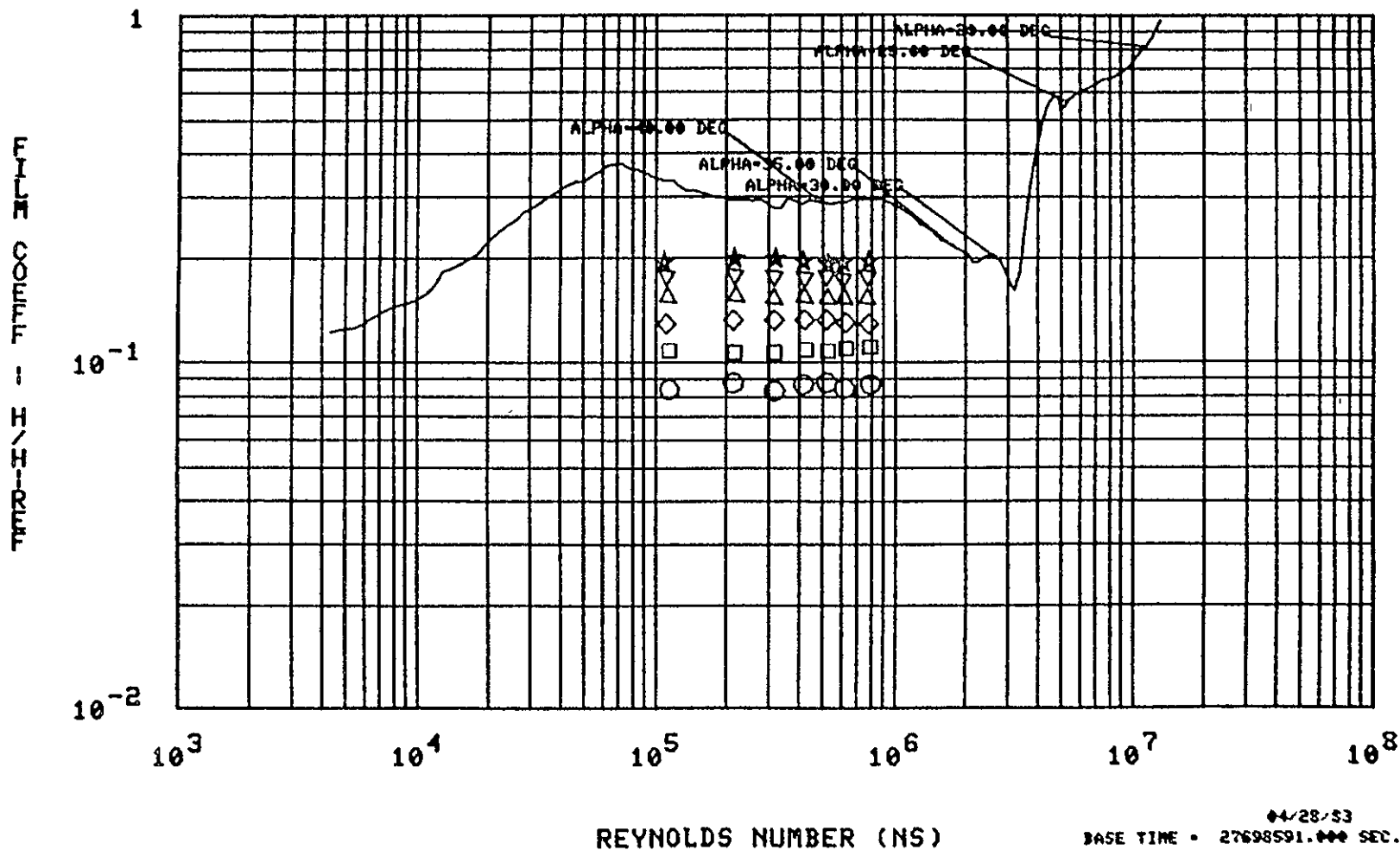
ORIGINAL PAGE IS  
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# STS-5 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9452A/H-REF 150-1350 SEC



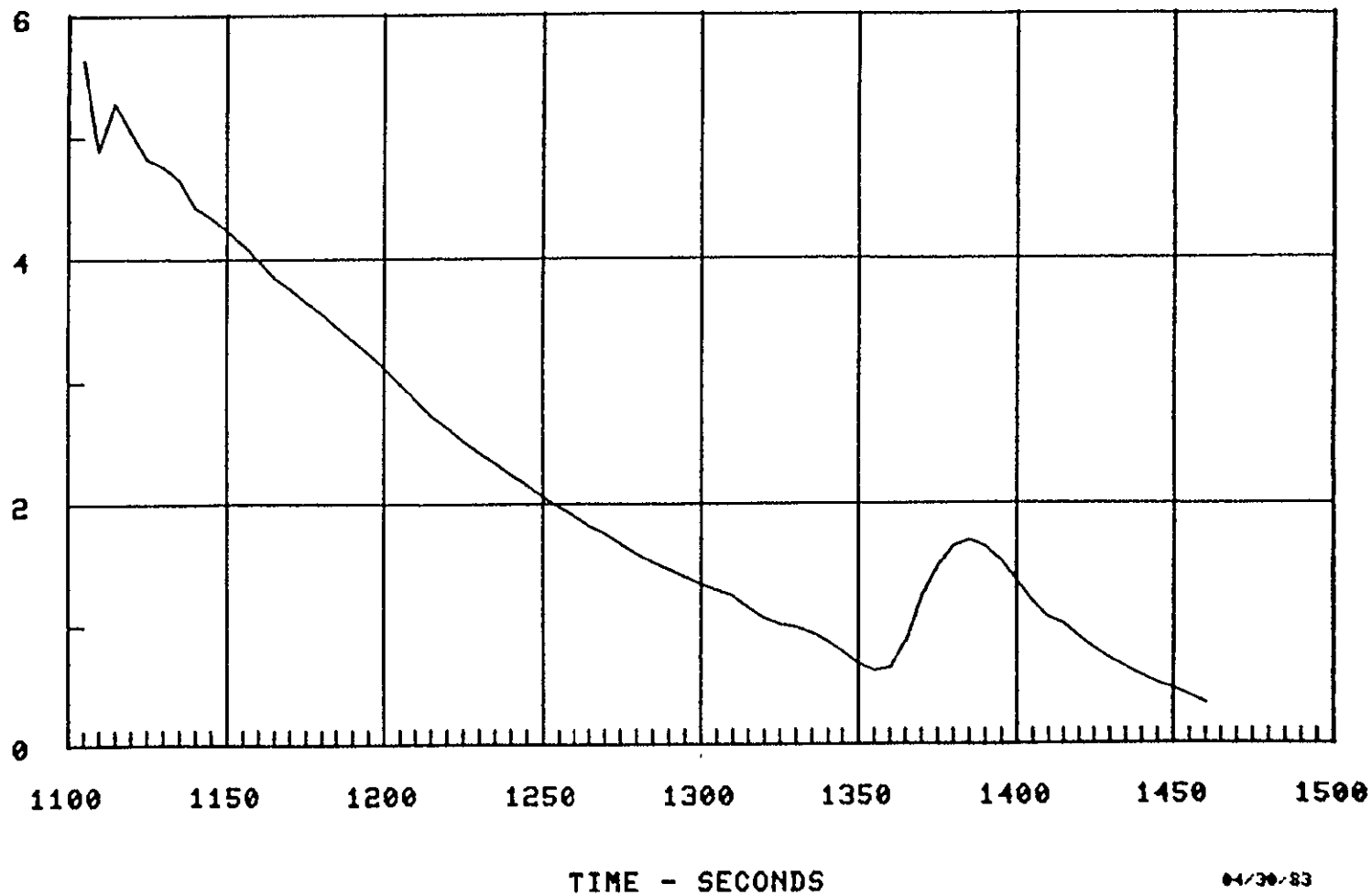
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# STS-1 (107 FT LENGTH CL $X/L=0.10$ ) FLIGHT PARAMETER COMPARISO

U07T9452A

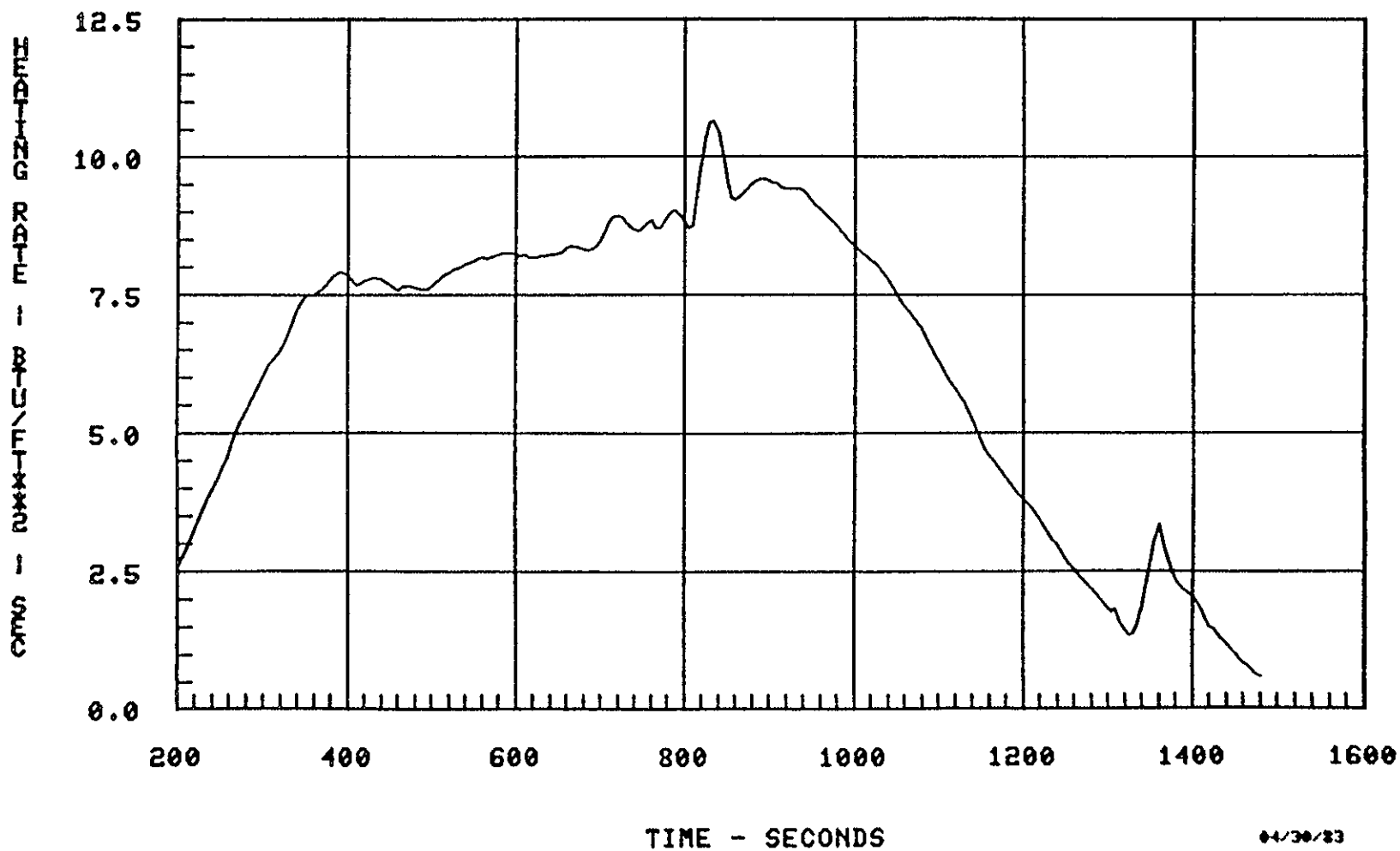
INTEGRATED RET-W -- AT-D/L-NNN -- SAKO



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# STS-2 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

U07T9452A

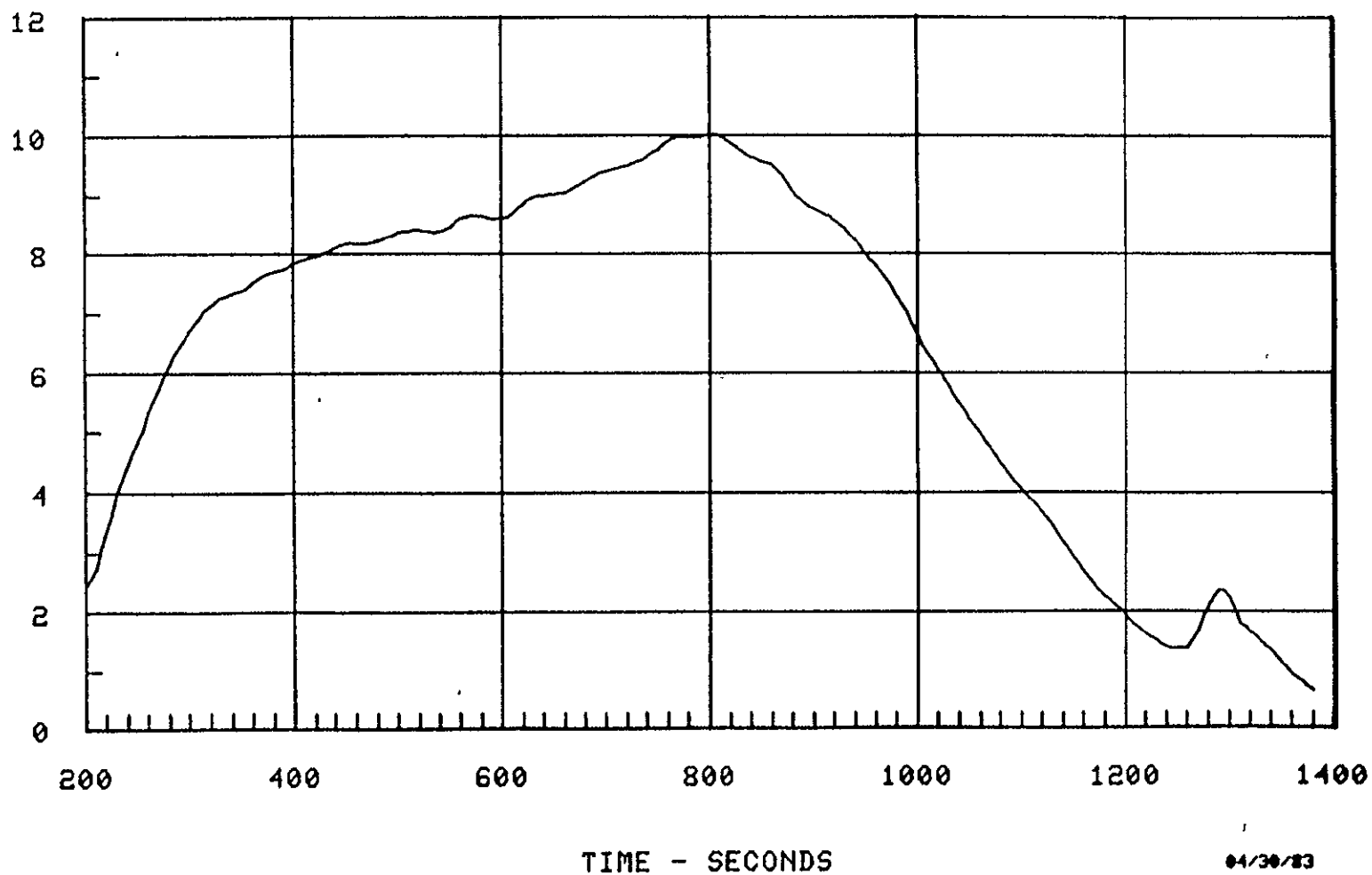


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STS-3 (107 FT LENGTH CL  $X/L=0.10$ ) FLIGHT PARAMETER COMPARISO

U07T9452A

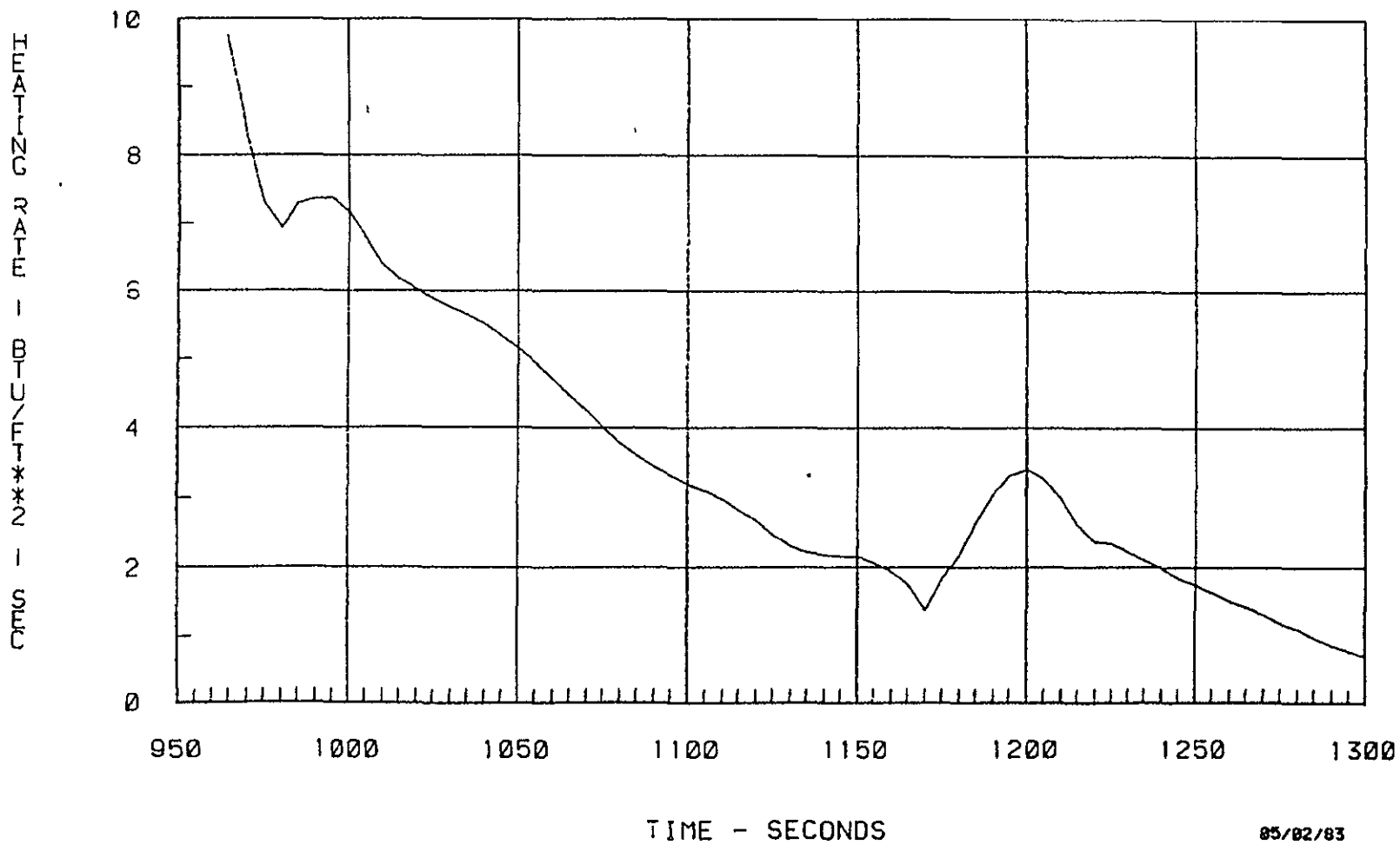
INTEGRATING ACCELERATION - G-VALUE



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STS-4 (107 FT LENGTH CL  $X/L=0.10$ ) FLIGHT PARAMETER COMPARISO

V07T0452A



B-44

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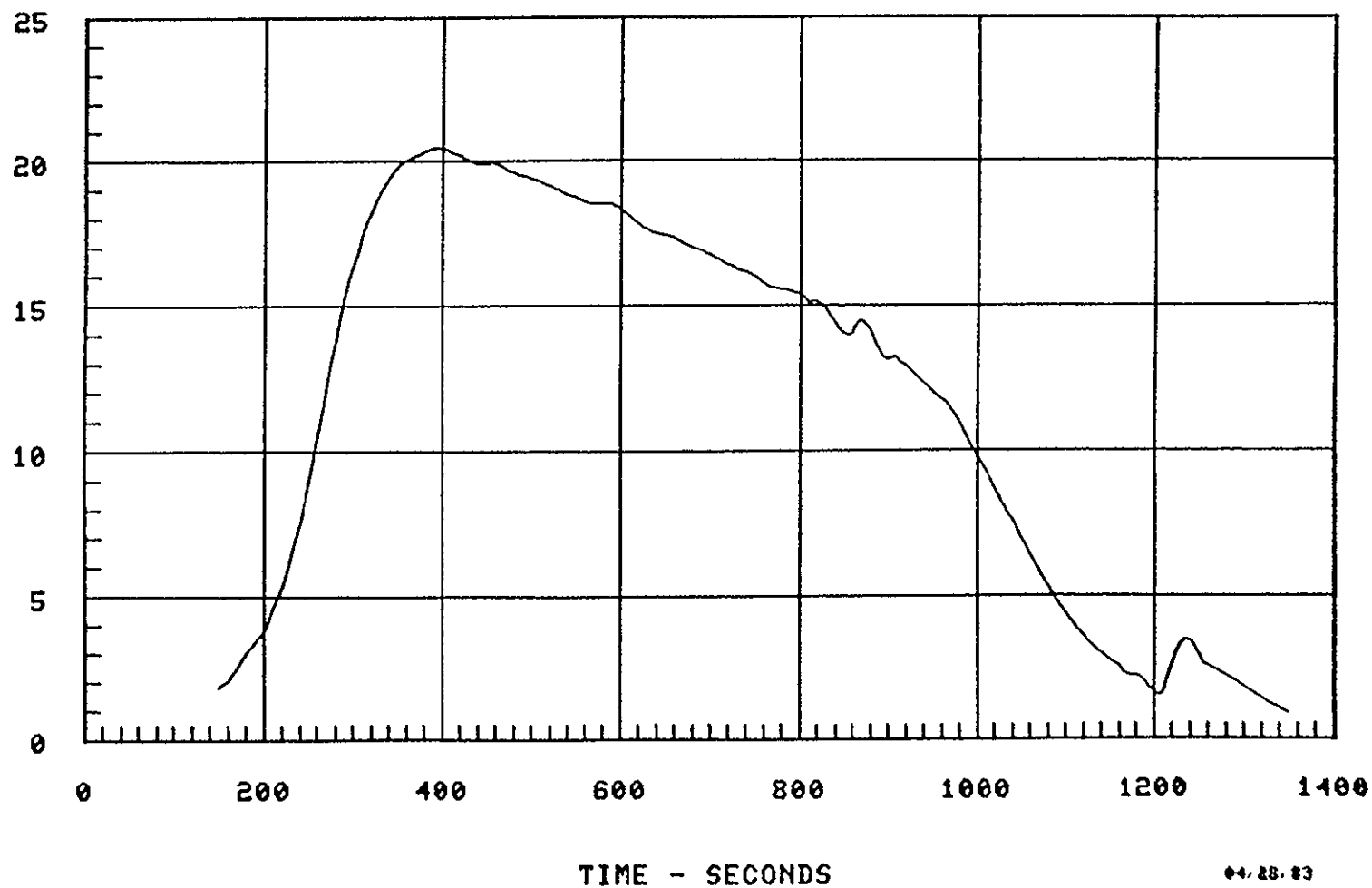
85/02/83

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U07T9452A

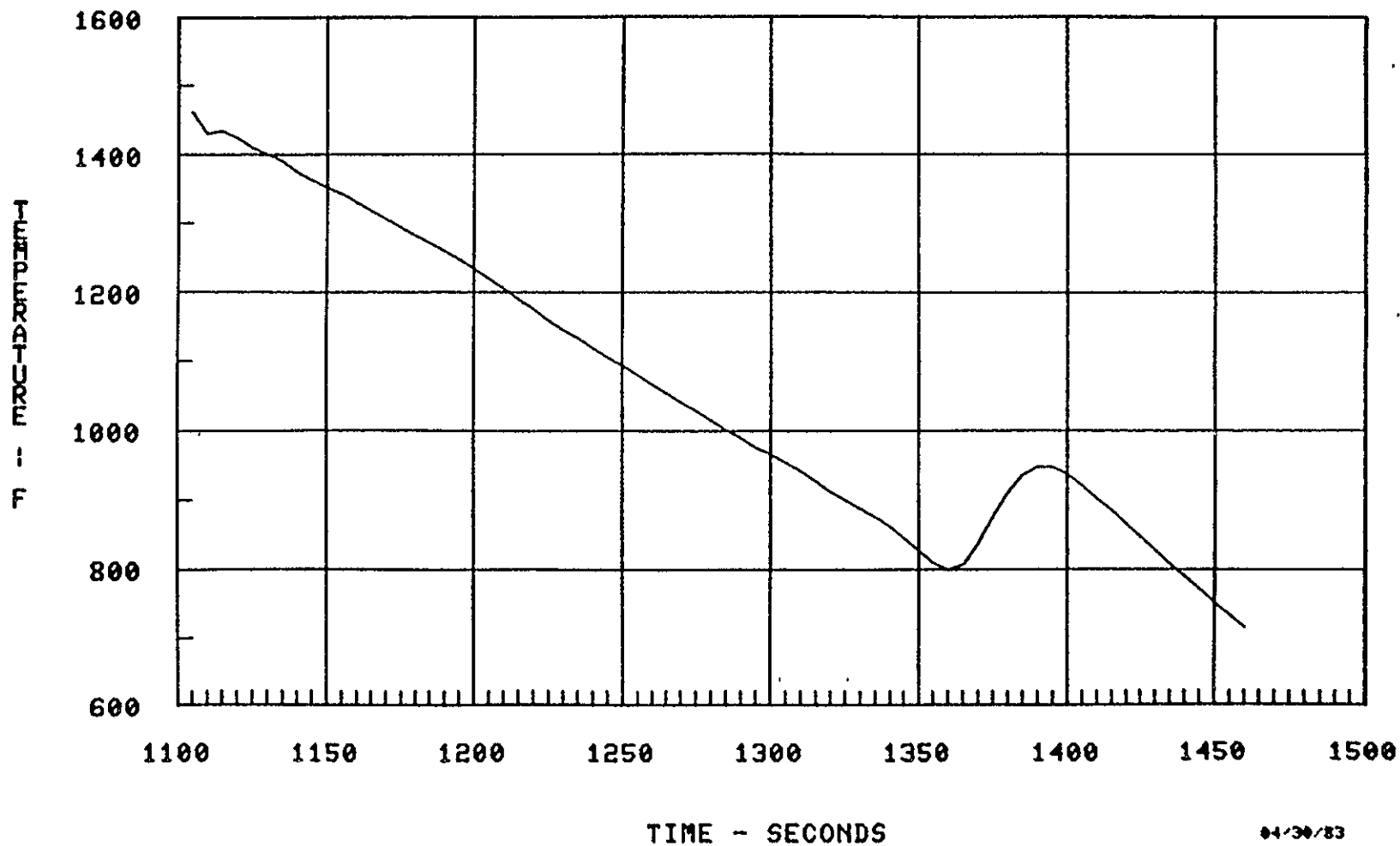
HEIGHT - FEET - MIN/SECONDS - GMS

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# STS-1 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

U07T9452A



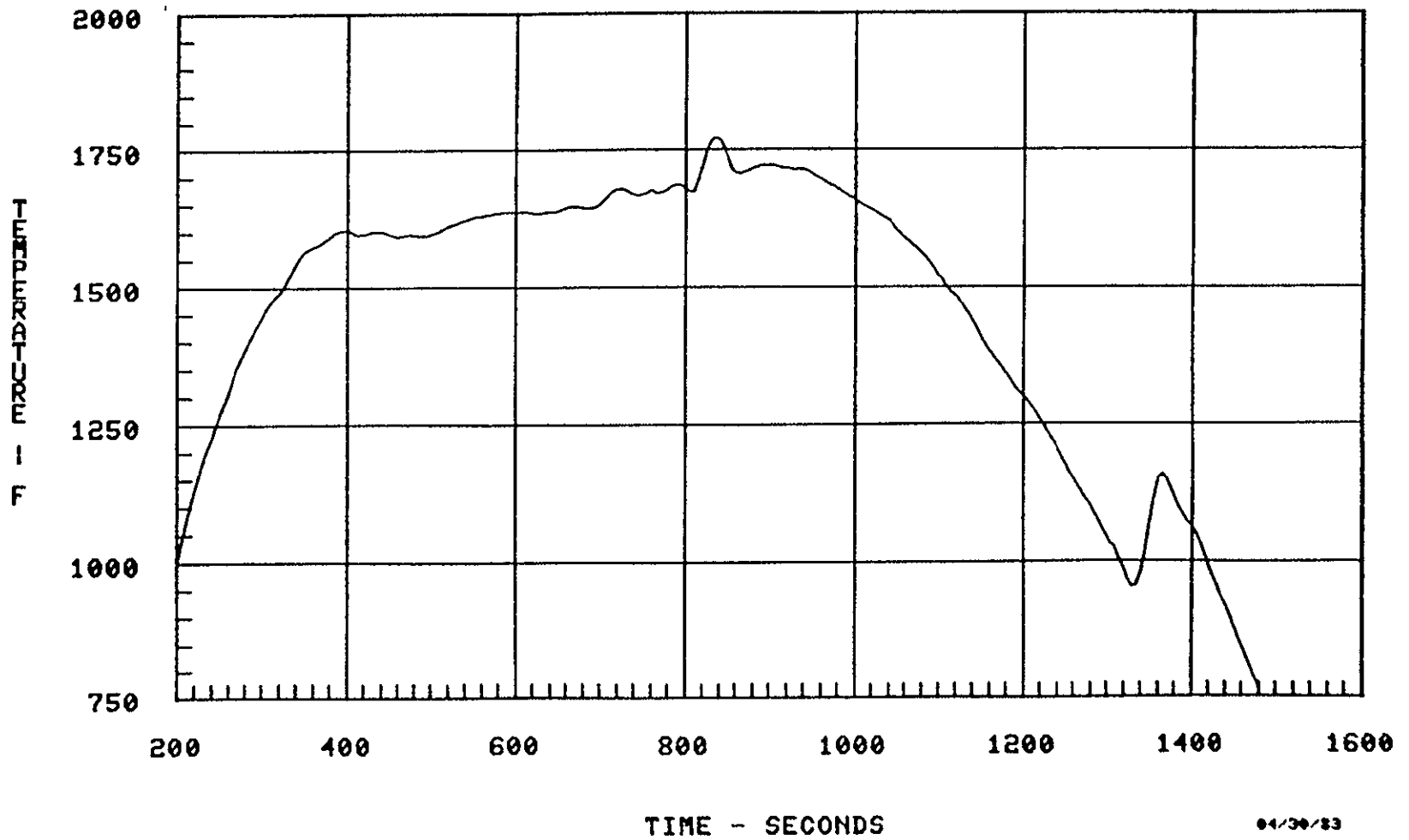
B-46

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04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

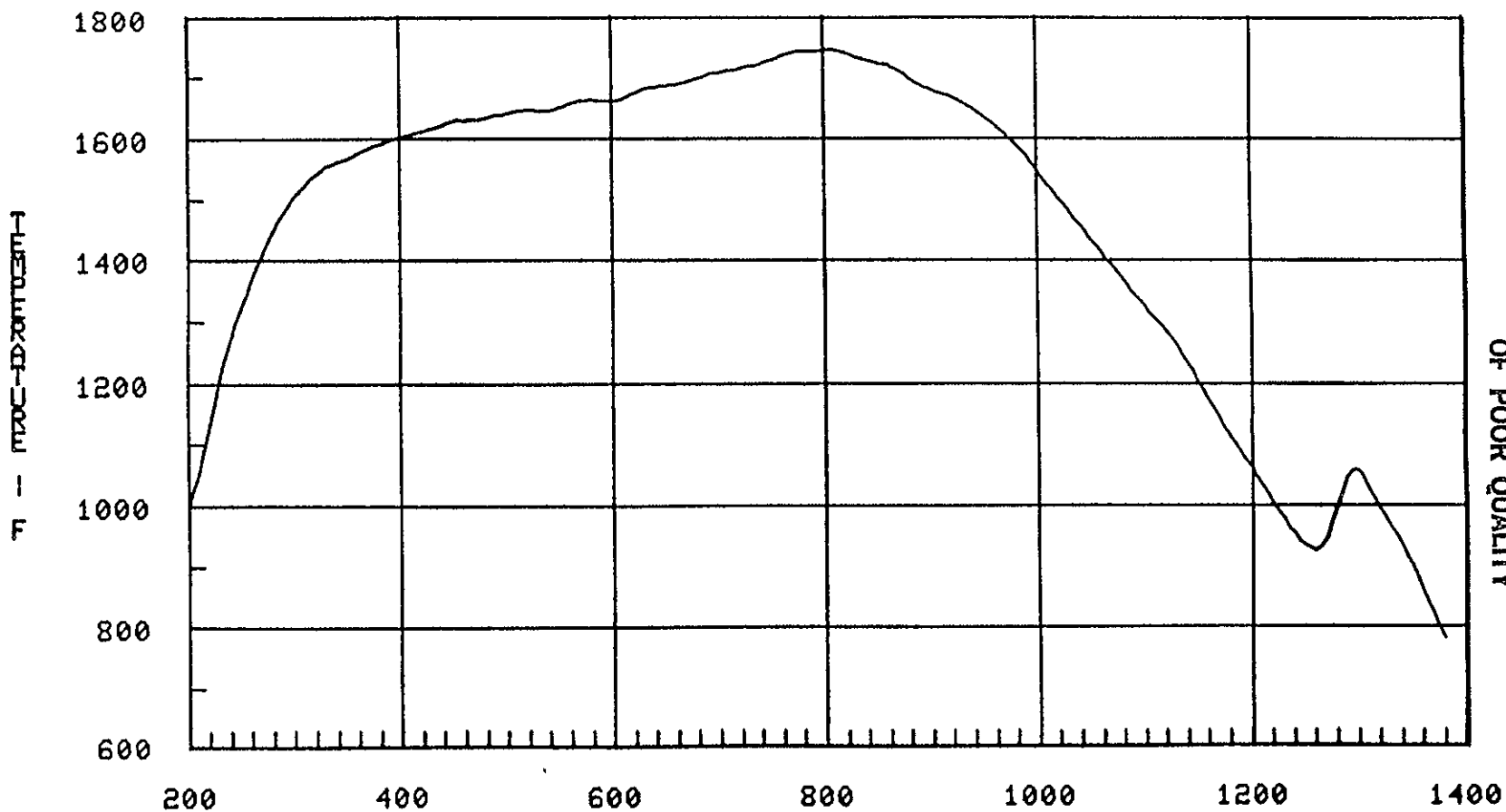
U07T9452A



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# STS-3 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

U07T9452A



TIME - SECONDS

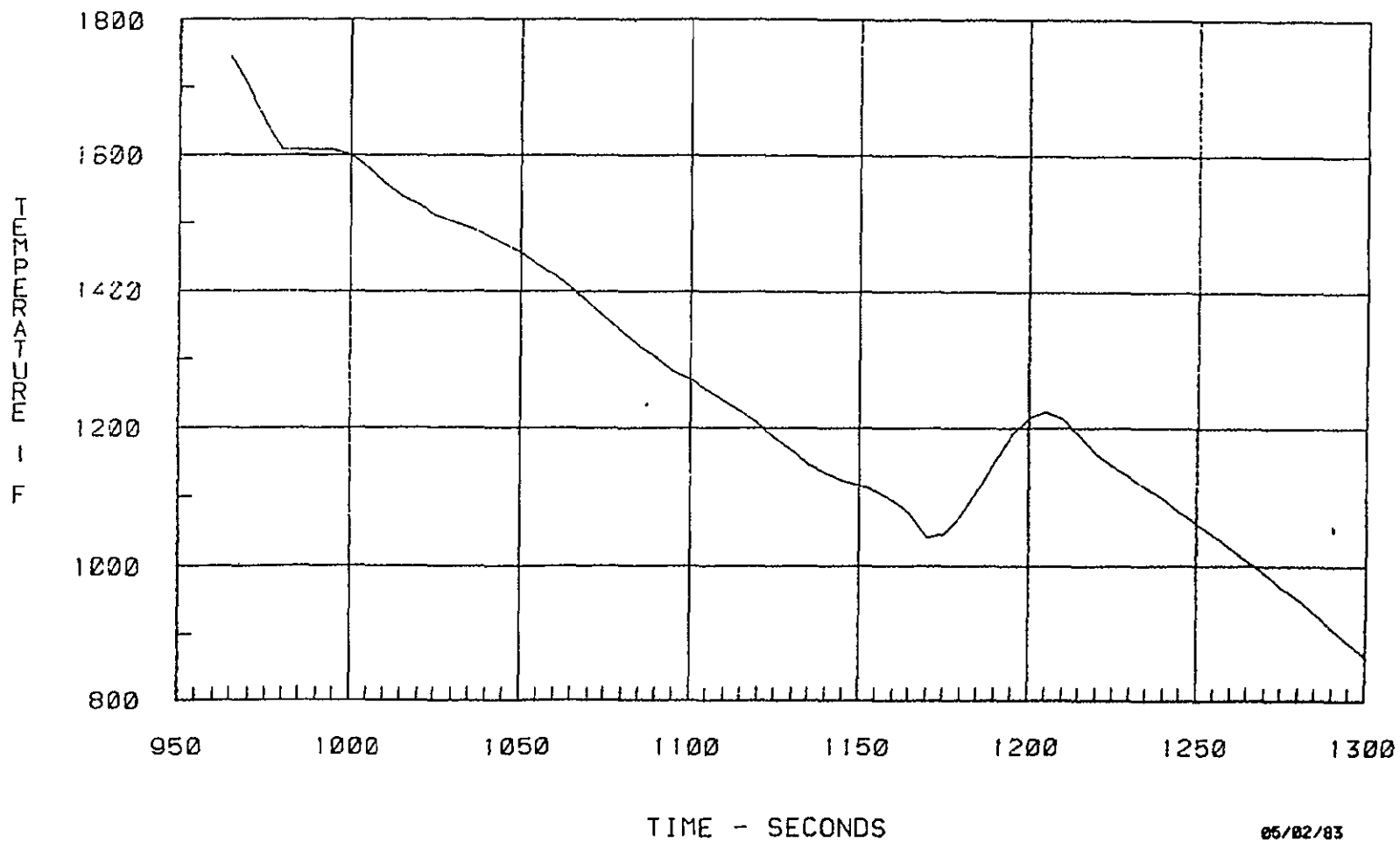
04/30/83

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STS-4 (107 FT LENGTH CL  $X/L=0.10$ ) FLIGHT PARAMETER COMPARISO

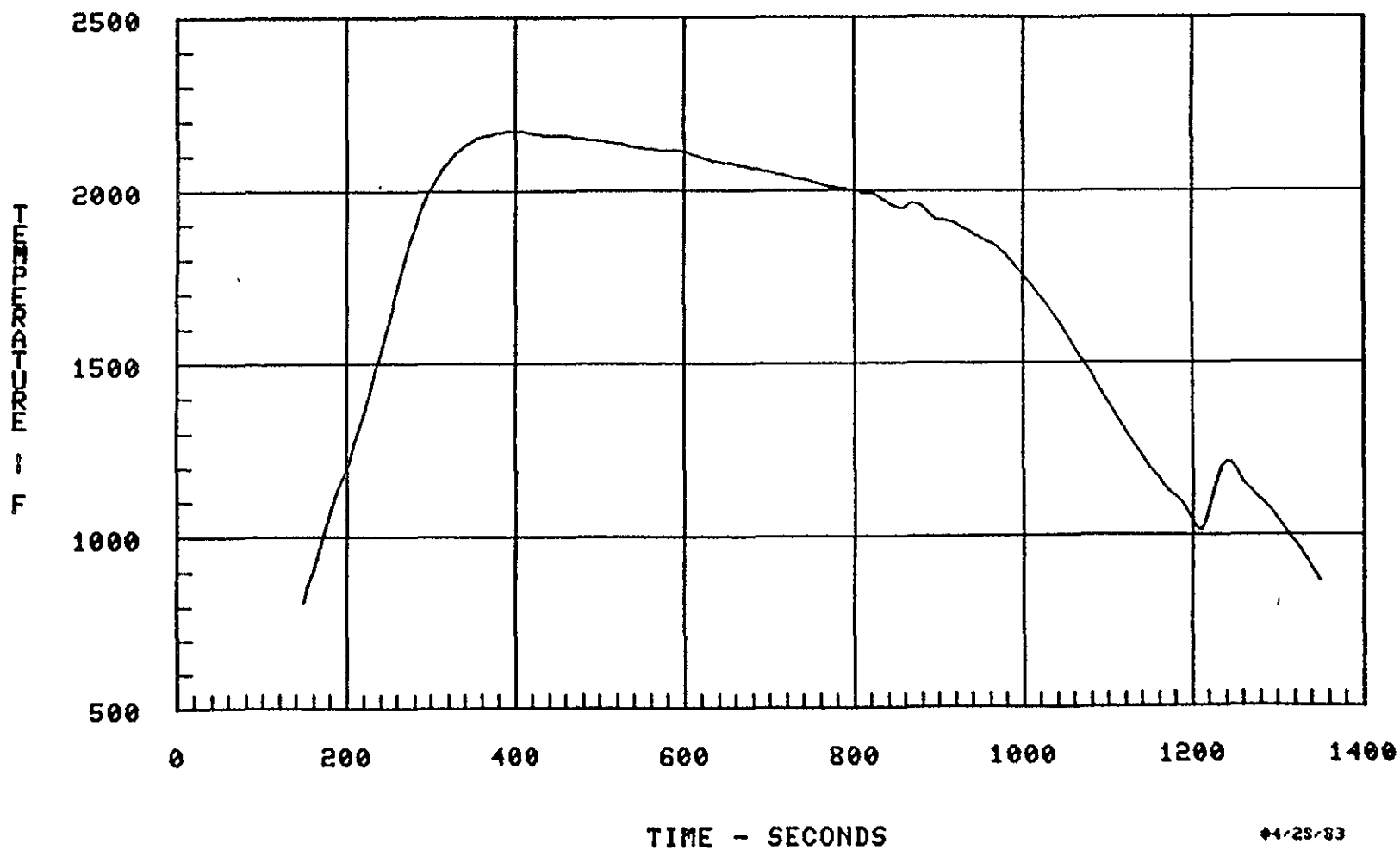
—— V07T0452A



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# STS-5 (107 FT LENGTH CL X/L=0.10) FLIGHT PARAMETER COMPARISO

U07T9452A



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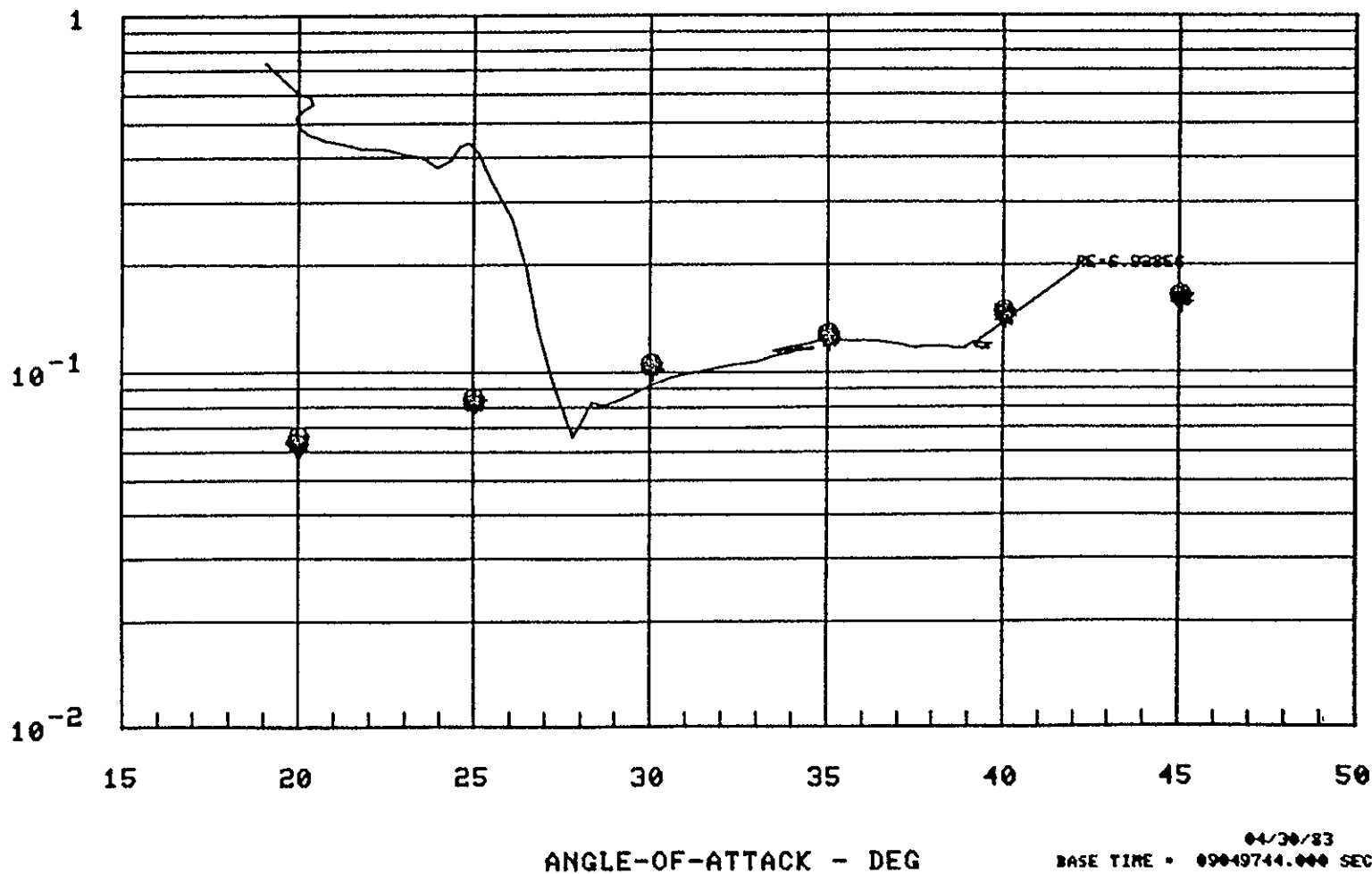
# STS-1 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

○  
◇  
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+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9462A/H-REF 1065-1460 SEC

LINE COUNT - I/I-CURV



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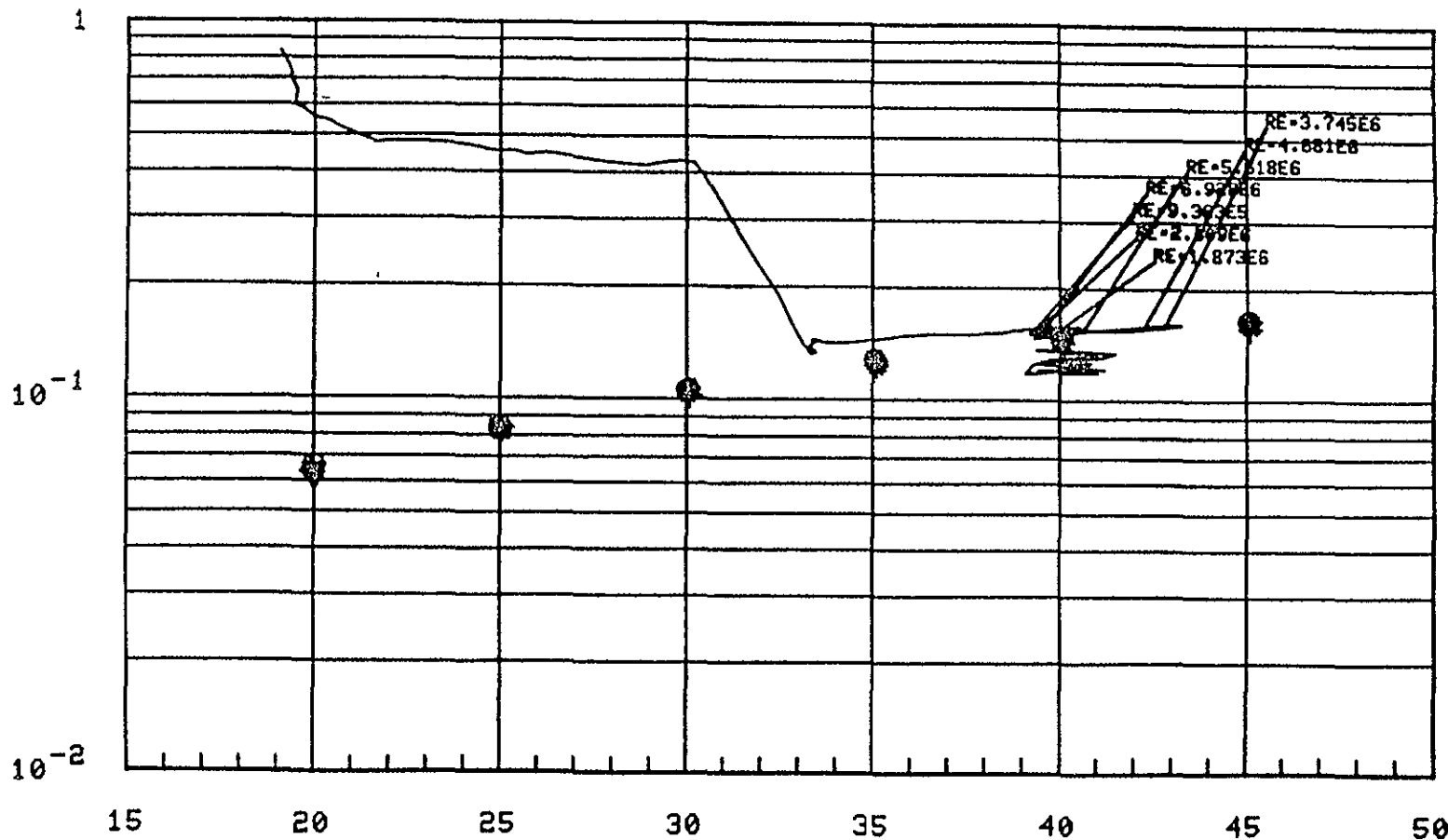
# STS-3 (107 FT LENGTH CL $X/L=0.14$ ) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9462A/H-REF 200-1380 SEC

LINE COUNT - I/I-0244



ANGLE-OF-ATTACK - DEG

04/30/83  
BASE TIME = 07745684.000 SEC.

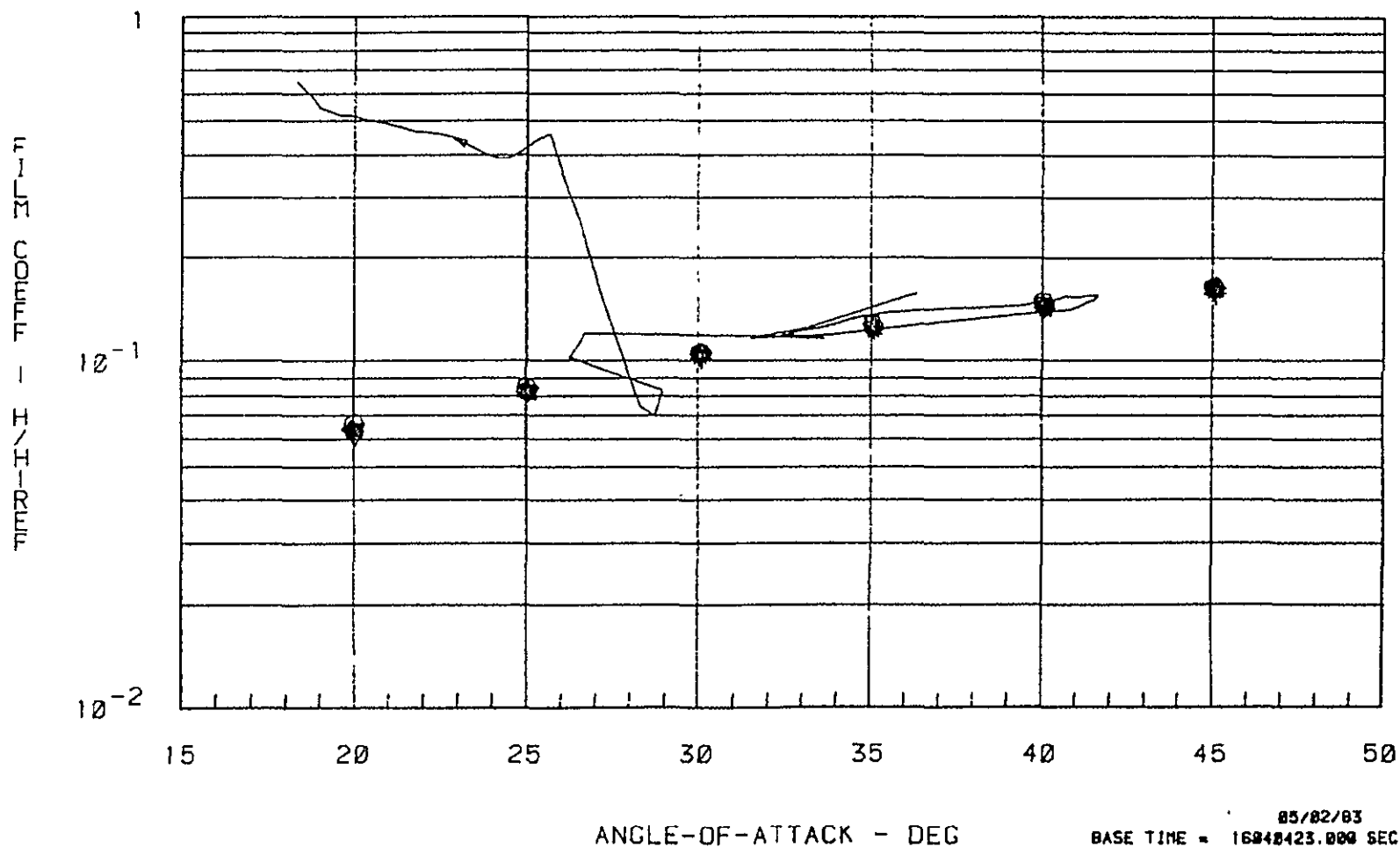
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# STS-4 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISON

○  
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★  
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DH49 0.0175 SCALE RE = 0.5 E06  
 DH49 0.0175 SCALE RE = 1.0 E06  
 DH49 0.0175 SCALE RE = 1.5 E06  
 DH49 0.0175 SCALE RE = 2.0 E06  
 DH49 0.0175 SCALE RE = 2.5 E06  
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V07T0462A/H-REF 065-1300 SEC



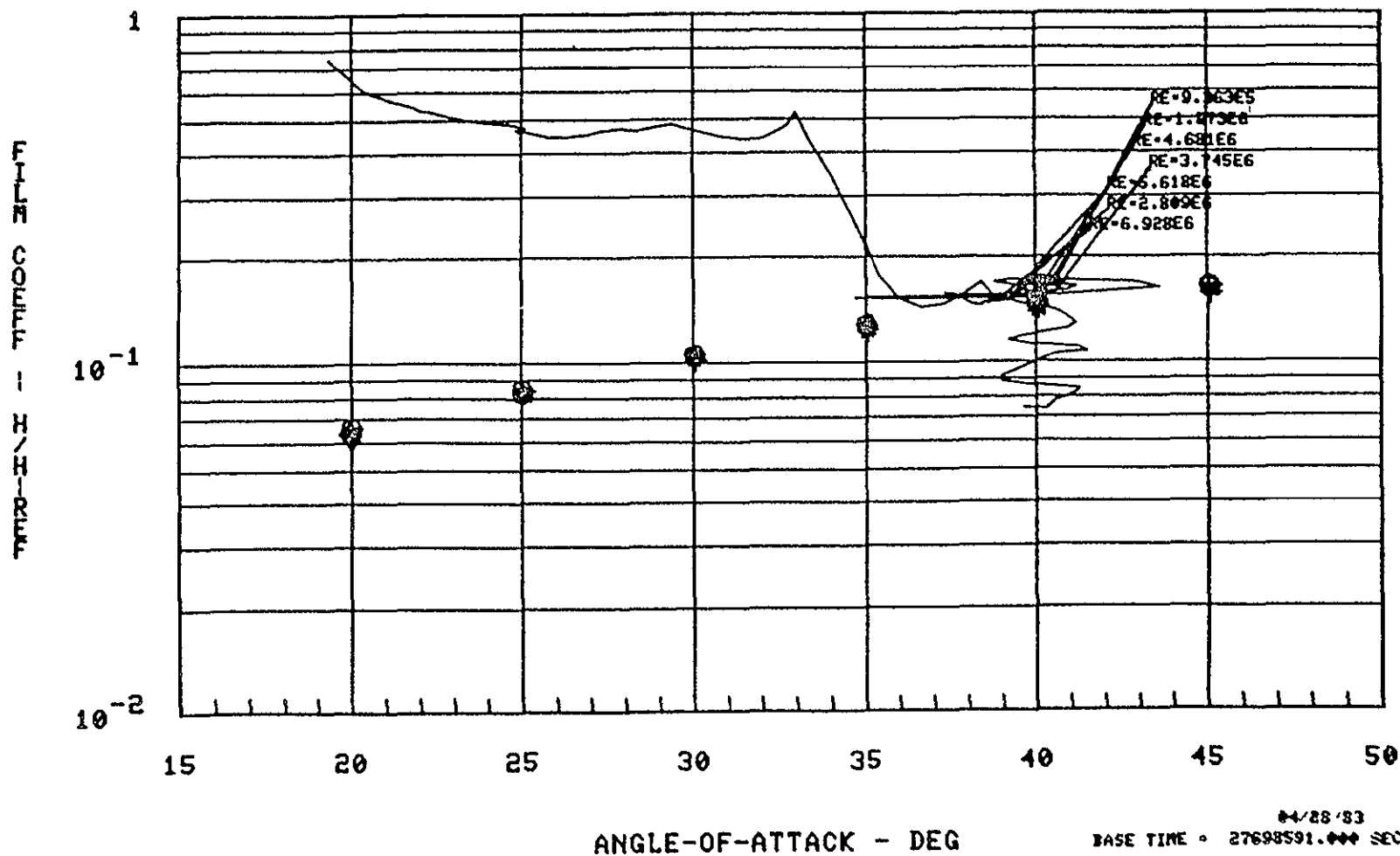
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# STS-5 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

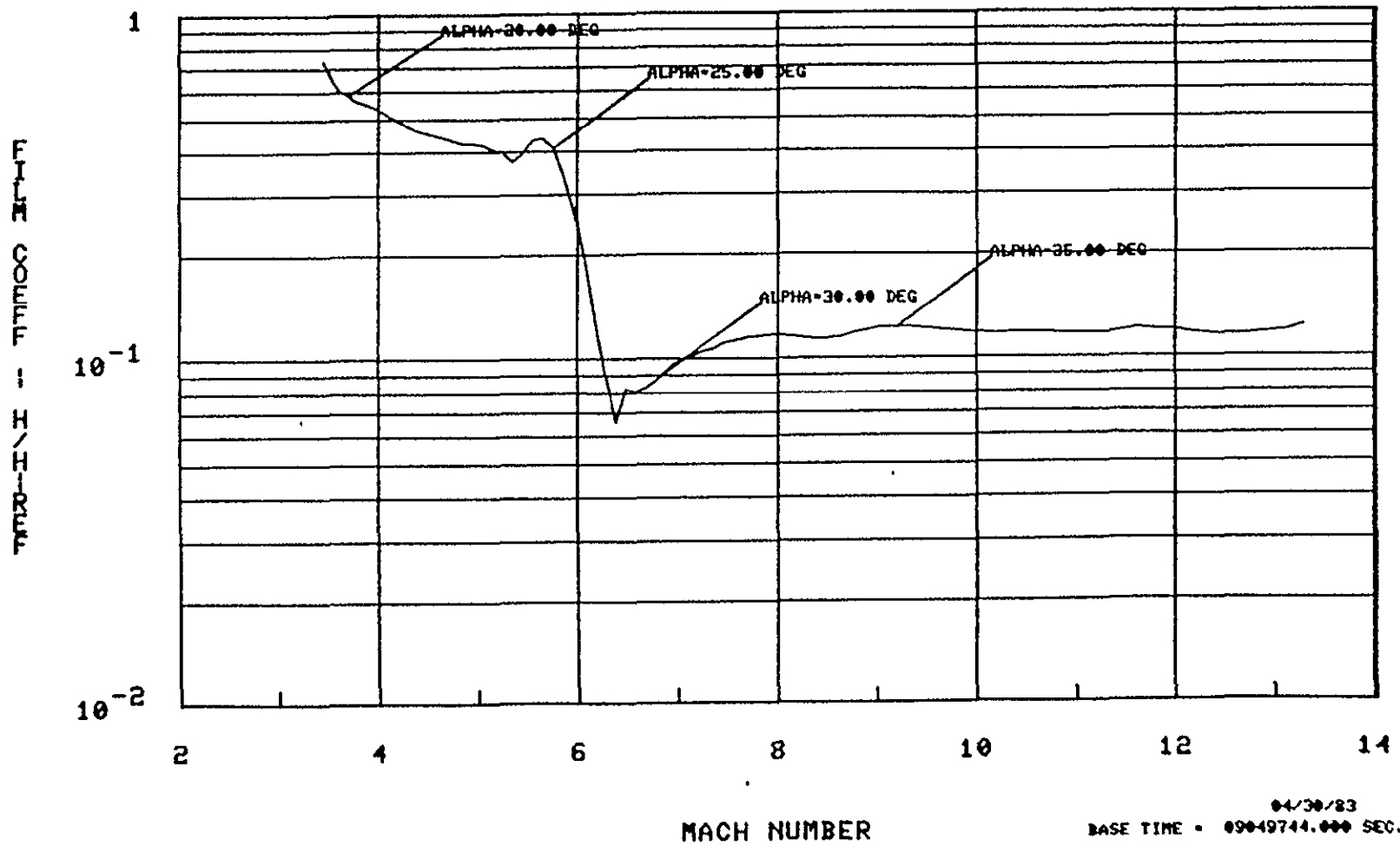
U0779462A/H-REF 150-1350 SEC



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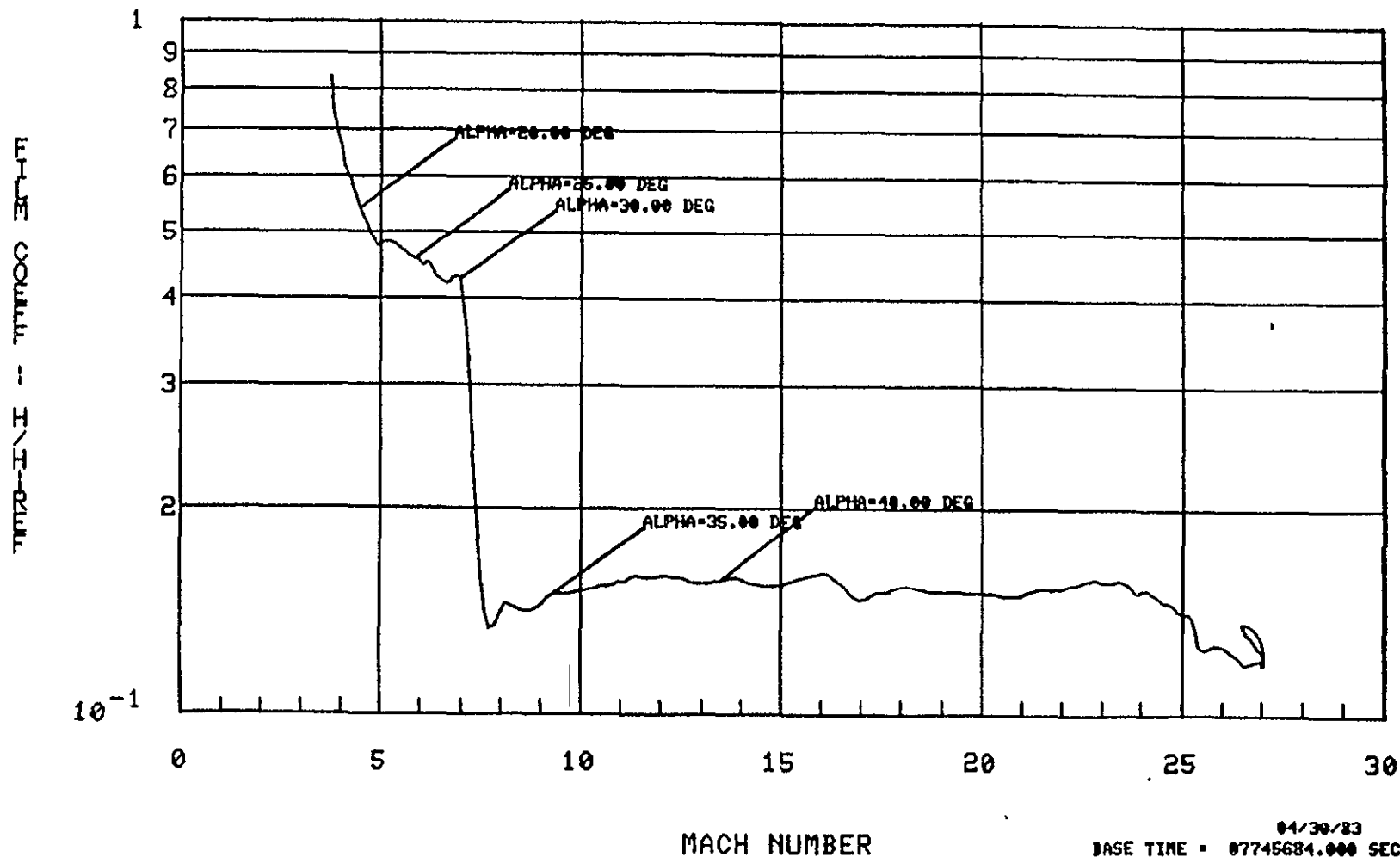
# STS-1 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

U07T9462A/H-REF 1065-1460 SEC



# STS-3 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

U07T9462A/H-REF 200-1380 SEC



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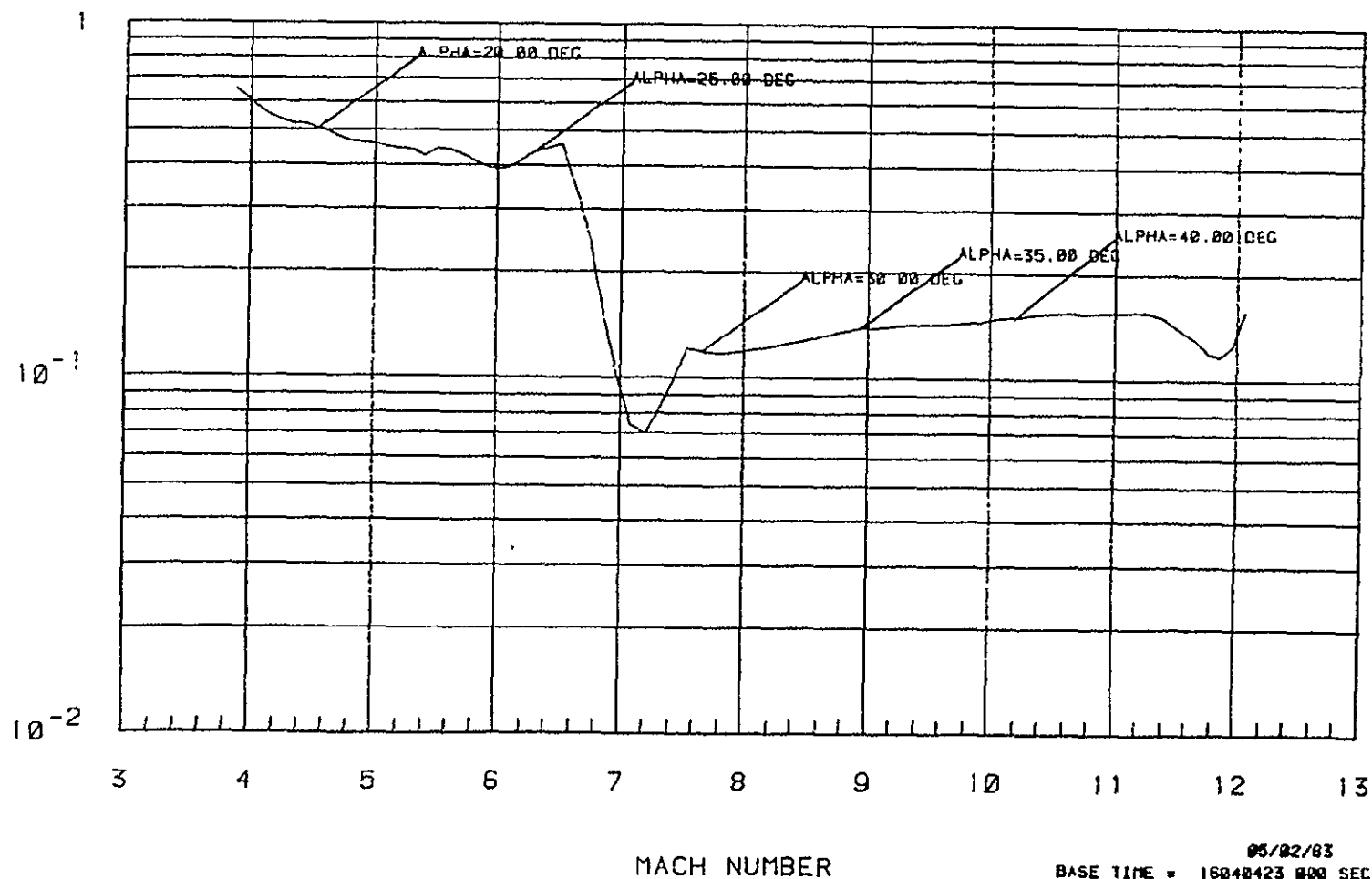


# STS-4 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISON

V07T0462A/H-REF 065-1300 SEC

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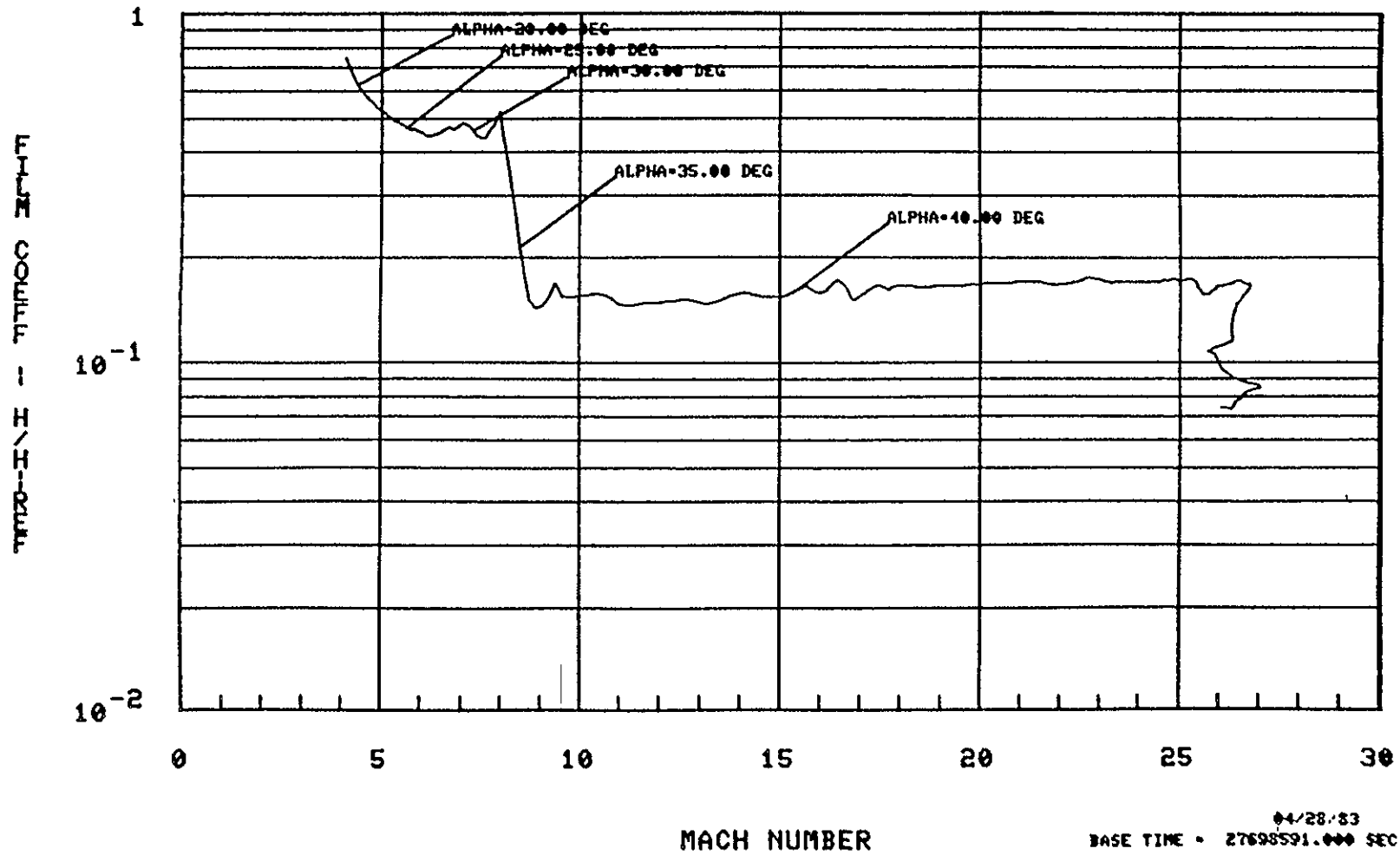
B-57



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# STS-5 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

U07T9462A/H-REF 150-1350 SEC



B-58

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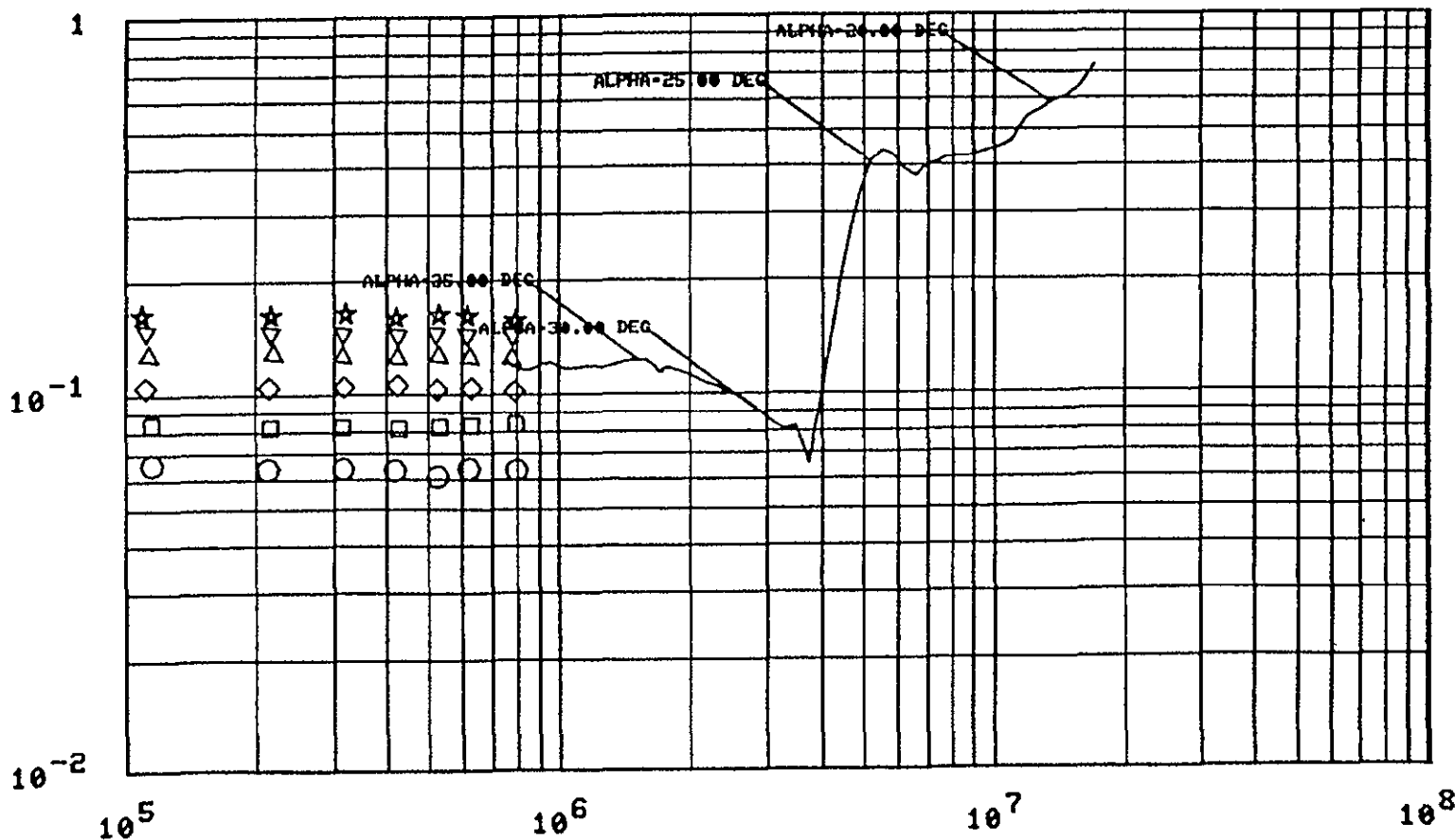
# STS-1 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9462A/H-REF 1065-1460 SEC

WING COEFFICIENT - H-REF



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B-59

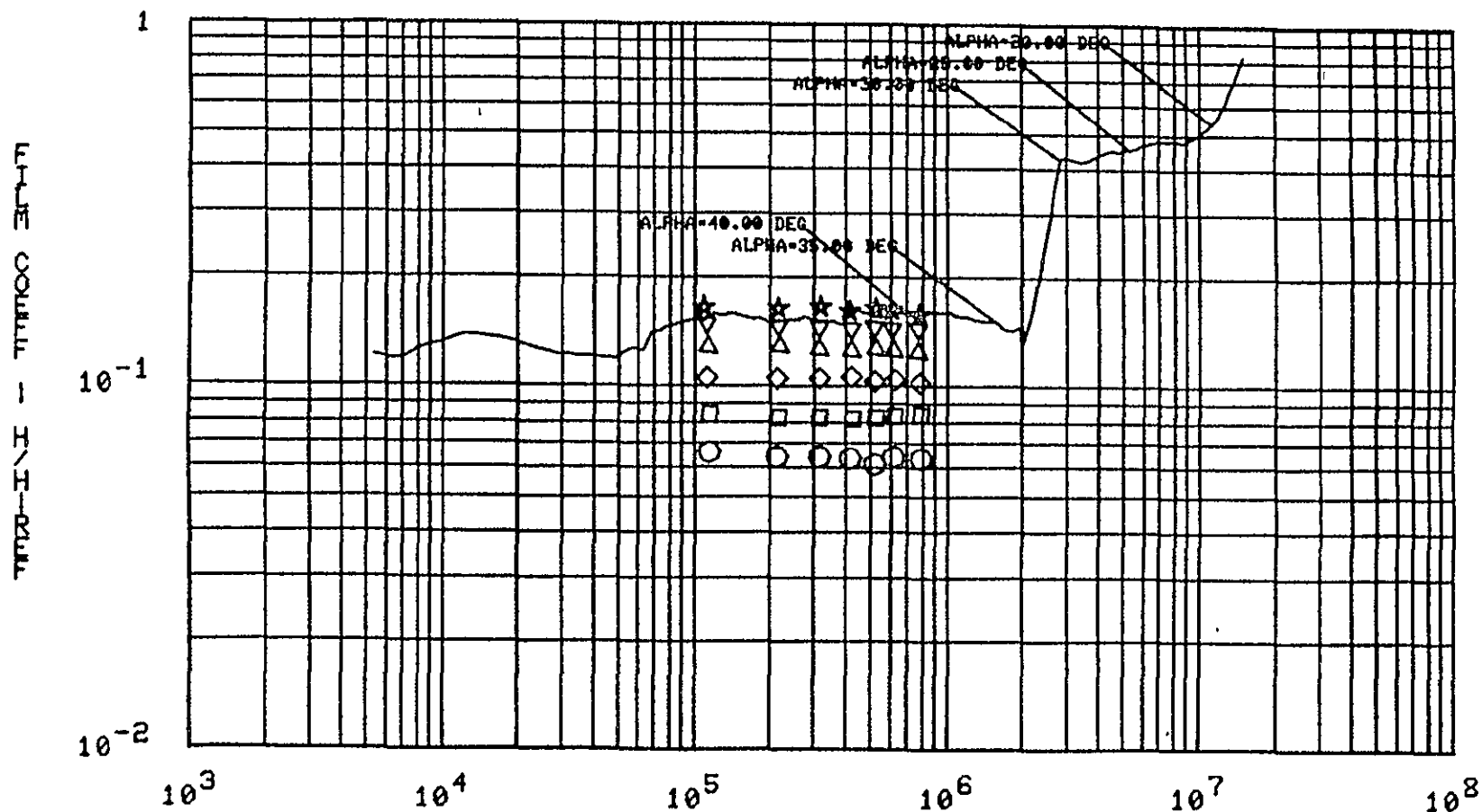
REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME = 09049744.000 SEC.

# STS-3 (107 FT LENGTH CL $X/L=0.14$ ) FLIGHT PARAMETER COMPARISON

$\circ$  OH49 ALPHA = 20 DEGREES  
 $\square$  OH49 ALPHA = 25 DEGREES  
 $\diamond$  OH49 ALPHA = 30 DEGREES  
 $\triangle$  OH49 ALPHA = 35 DEGREES  
 $\nabla$  OH49 ALPHA = 40 DEGREES  
 $\star$  OH49 ALPHA = 45 DEGREES

U07T9462A/H-REF 200-1380 SEC



B-60

CL vs NS - I/I-0000

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OF POOR QUALITY

REYNOLDS NUMBER (NS)

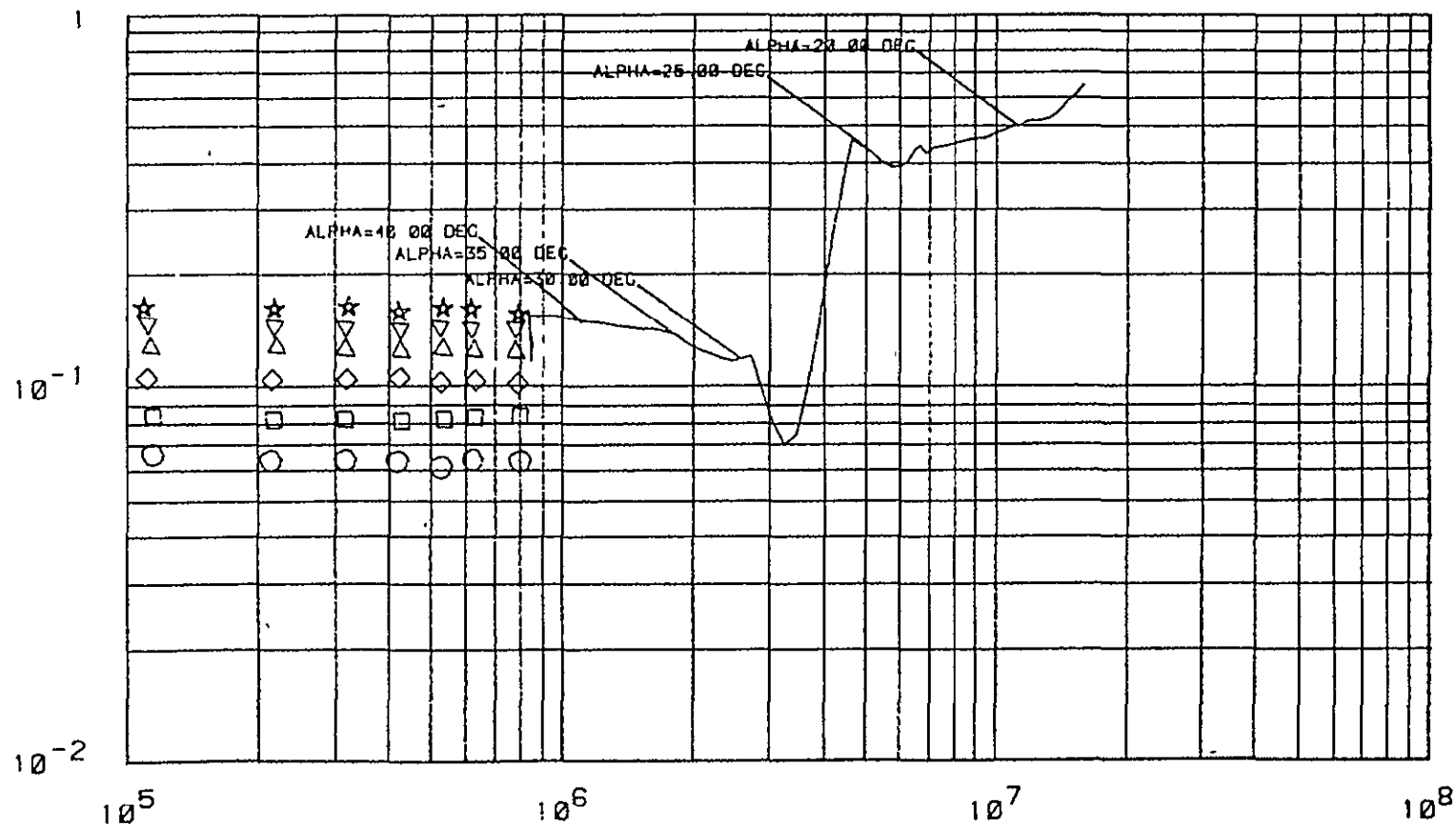
04/30/83  
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# STS-4 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

V07T0462A/H-REF 965-1300 SEC



REYNOLDS NUMBER (NS)

05/02/83  
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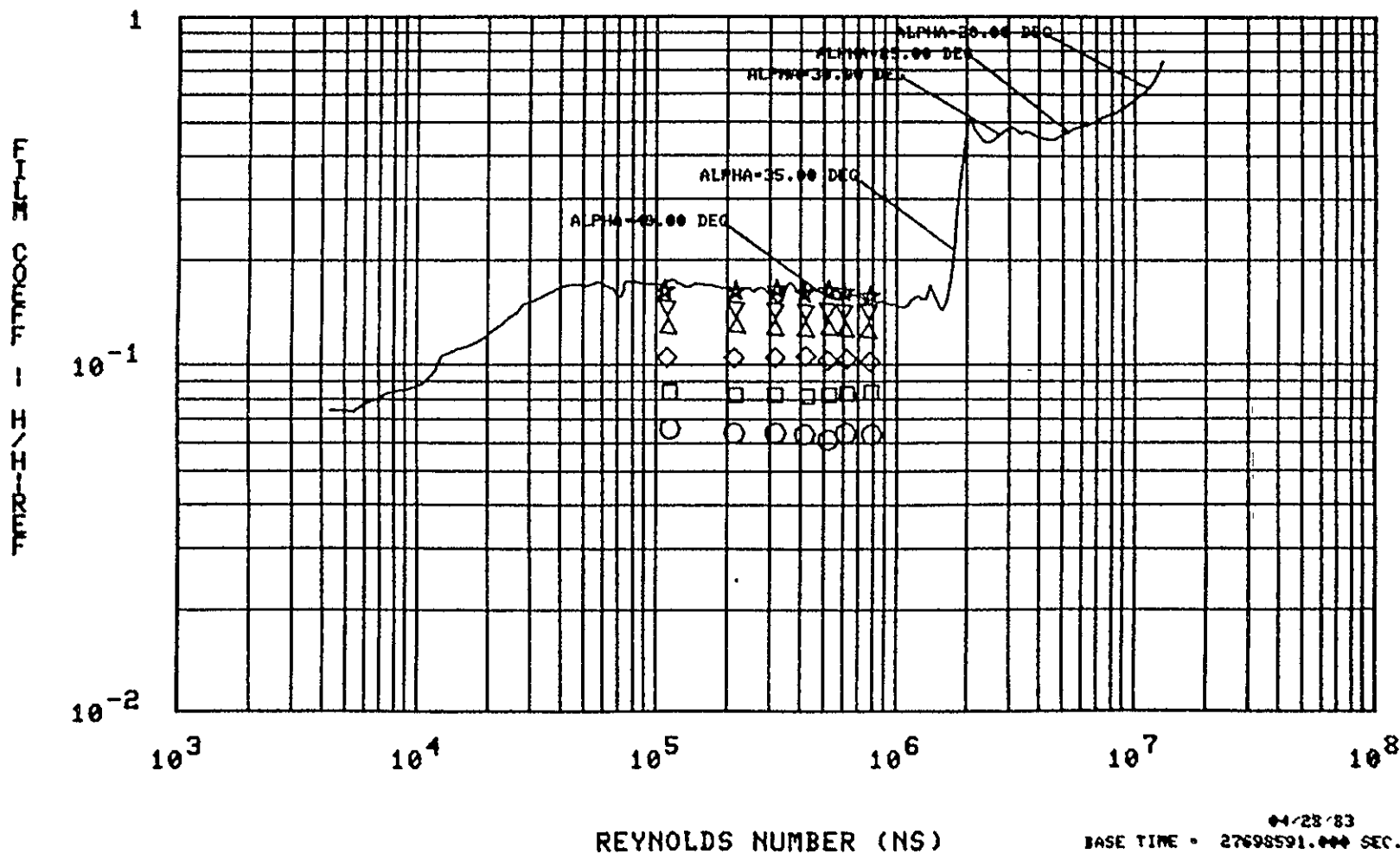
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# STS-5 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

○  
□  
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△  
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×★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

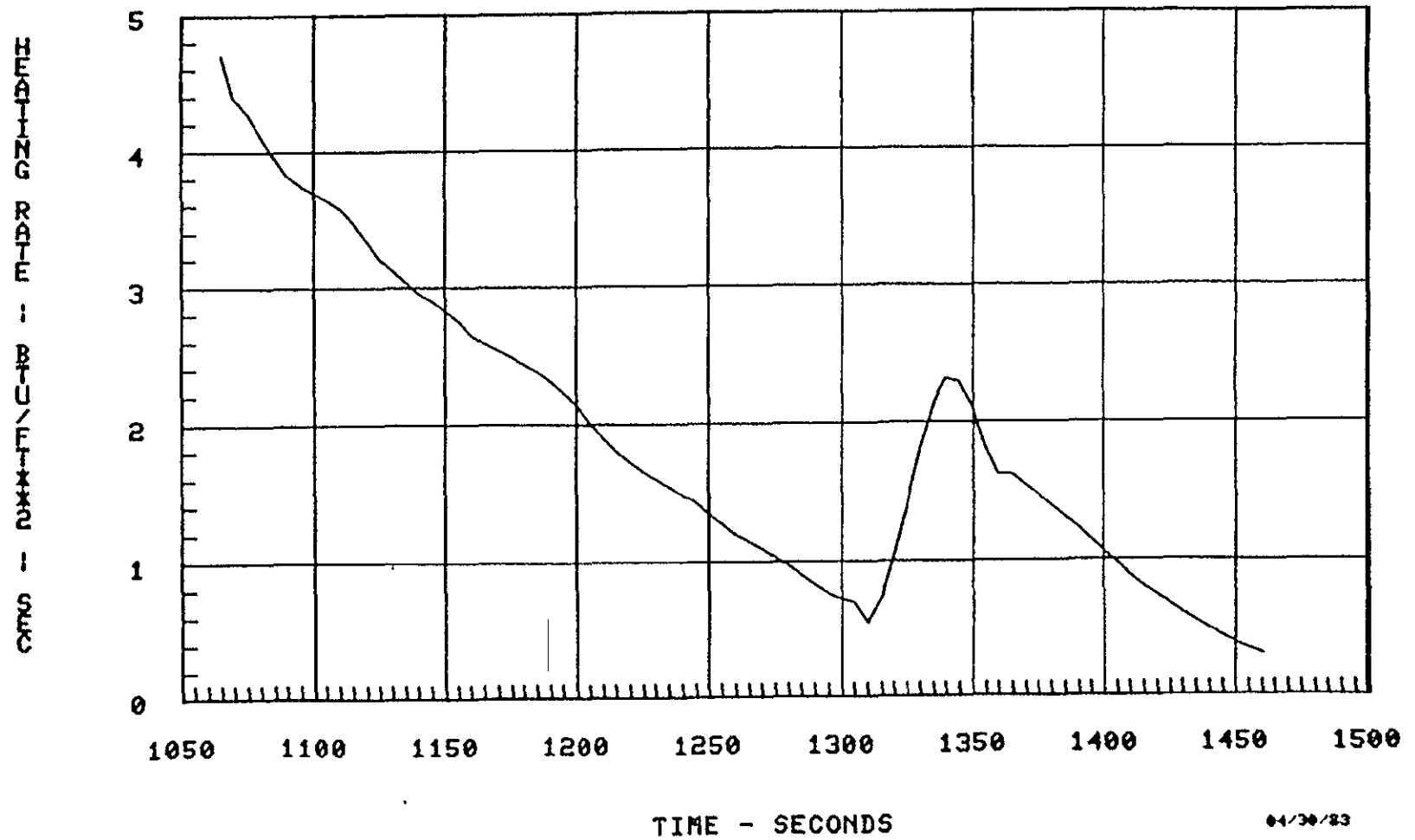
U07T9462A/H-REF 150-1350 SEC



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# STS-1 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

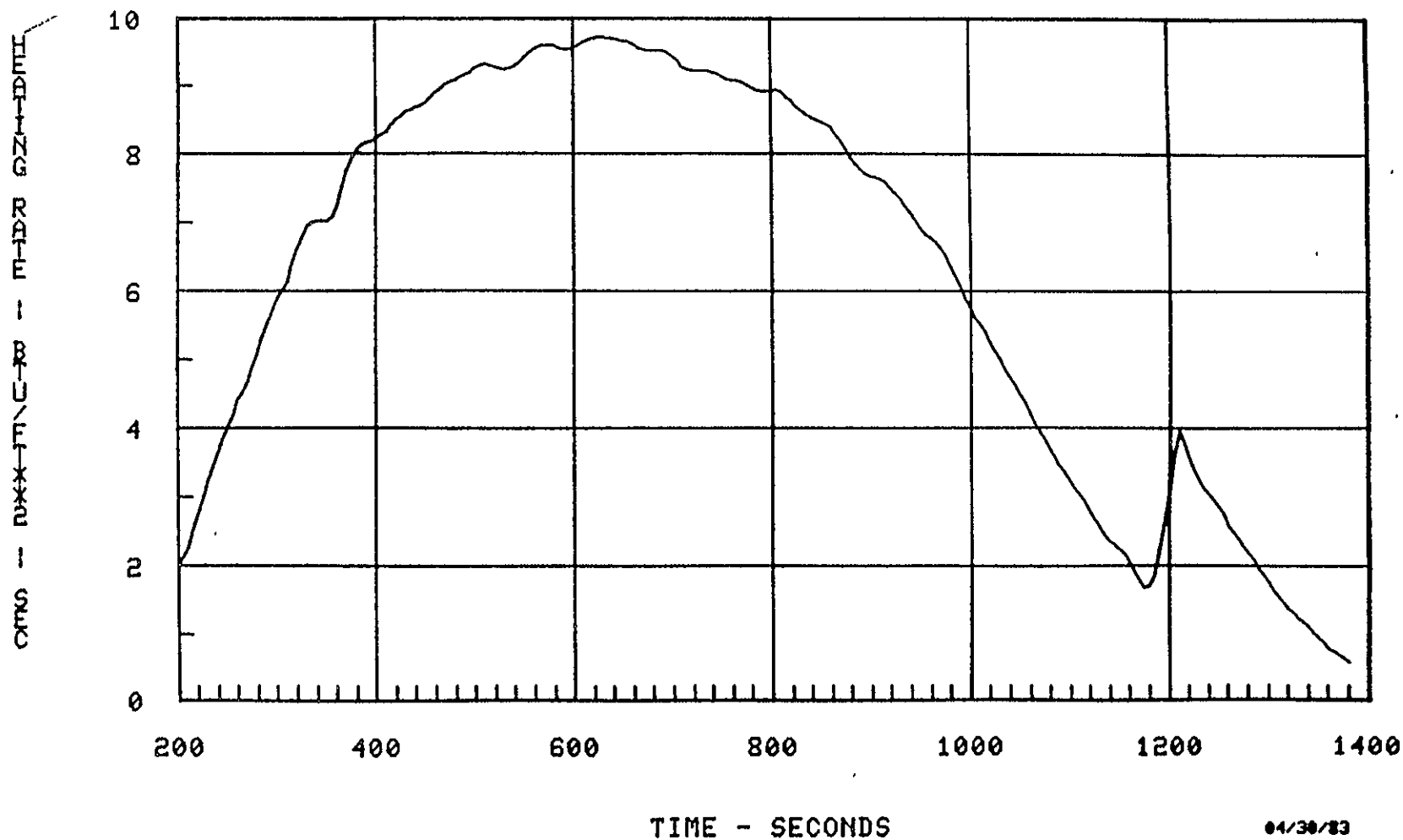
U07T9462A



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# STS-3 (107 FT LENGTH CL $X/L=0.14$ ) FLIGHT PARAMETER COMPARISO

U07T9462A



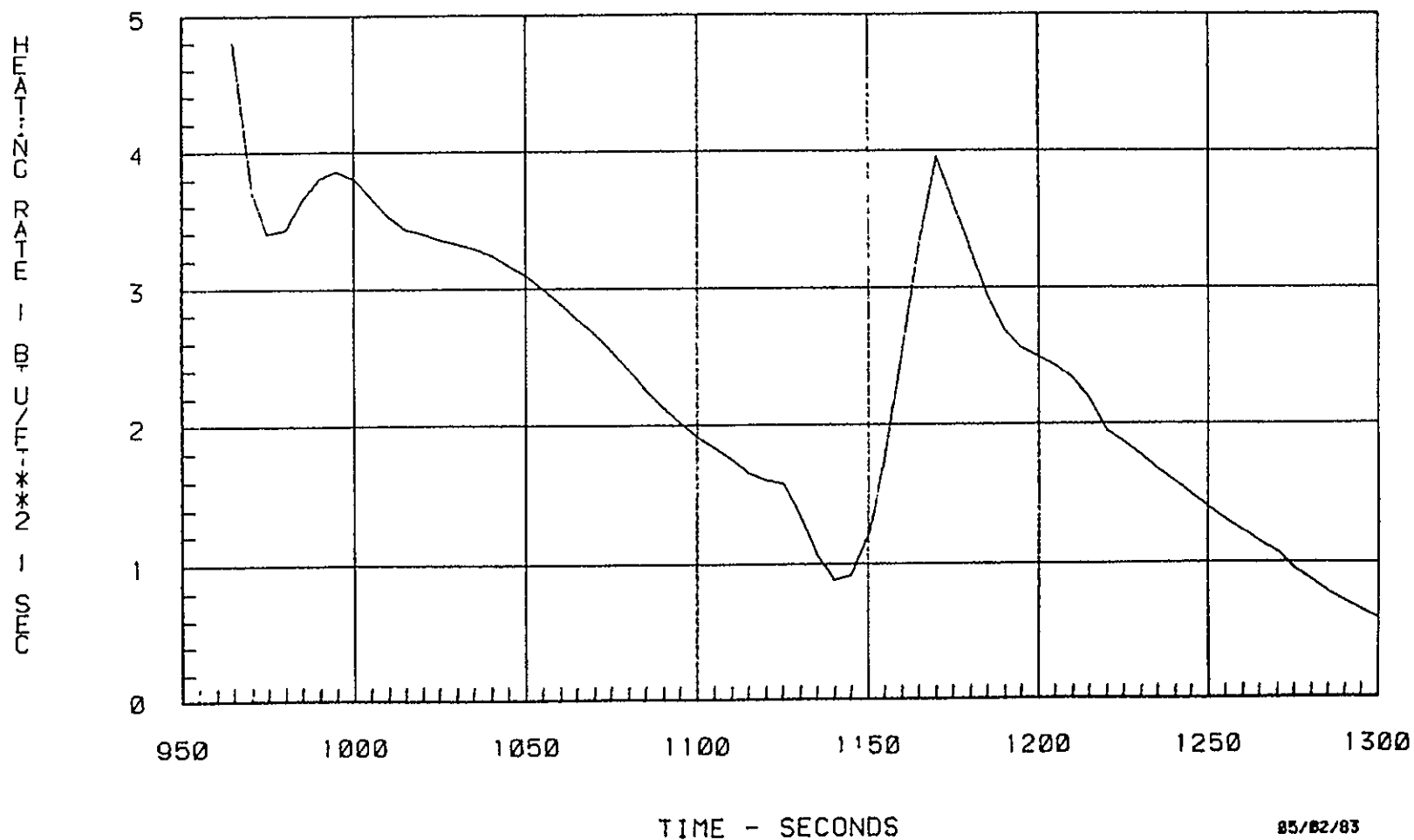
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04/30/83



# STS-4 (107 FT LENGTH CL $X/L=0.14$ ) FLIGHT PARAMETER COMPARISO

———— V07TQ462A



B-65

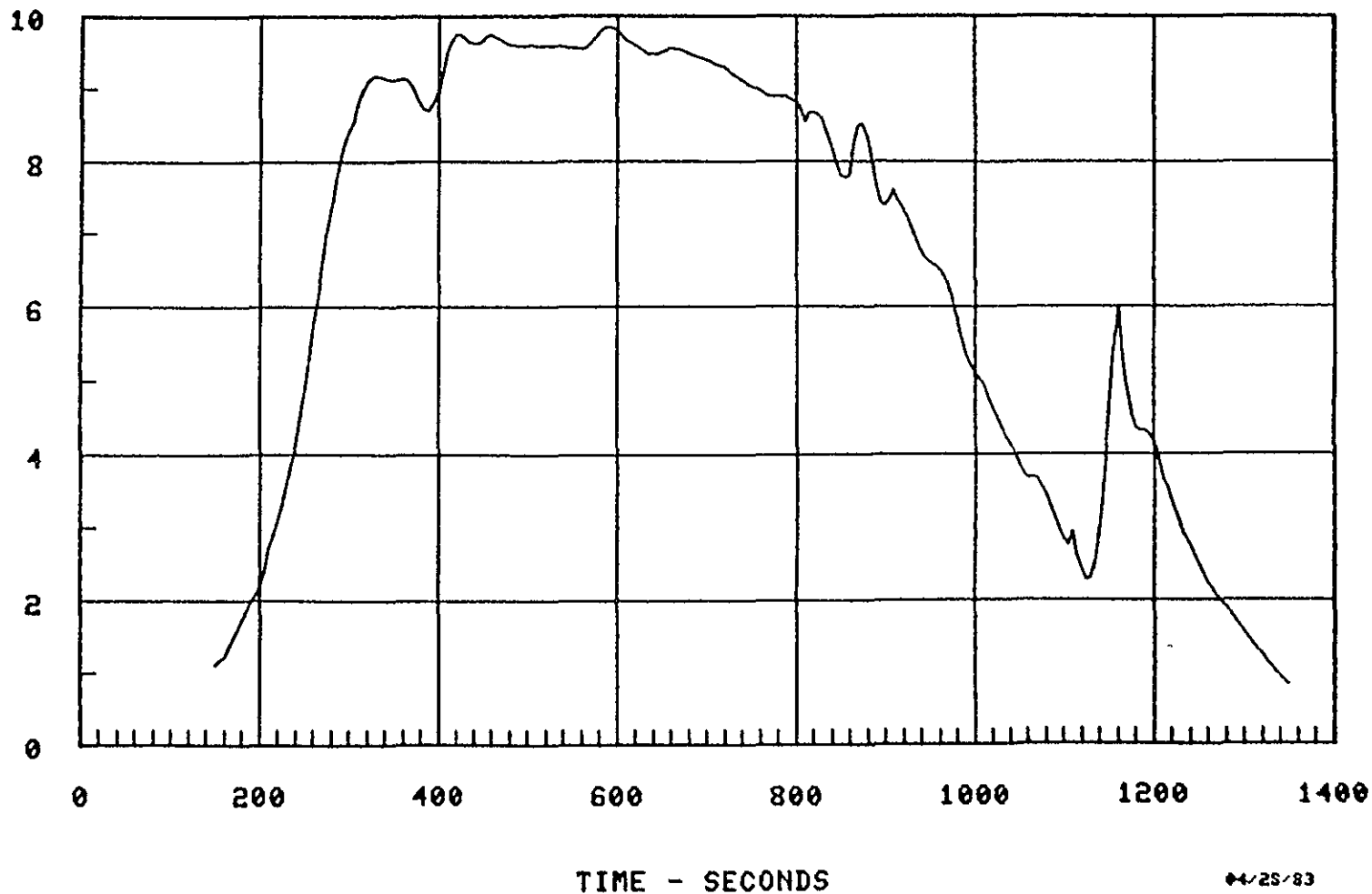
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85/82/83

# STS-5 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

U07T9462A

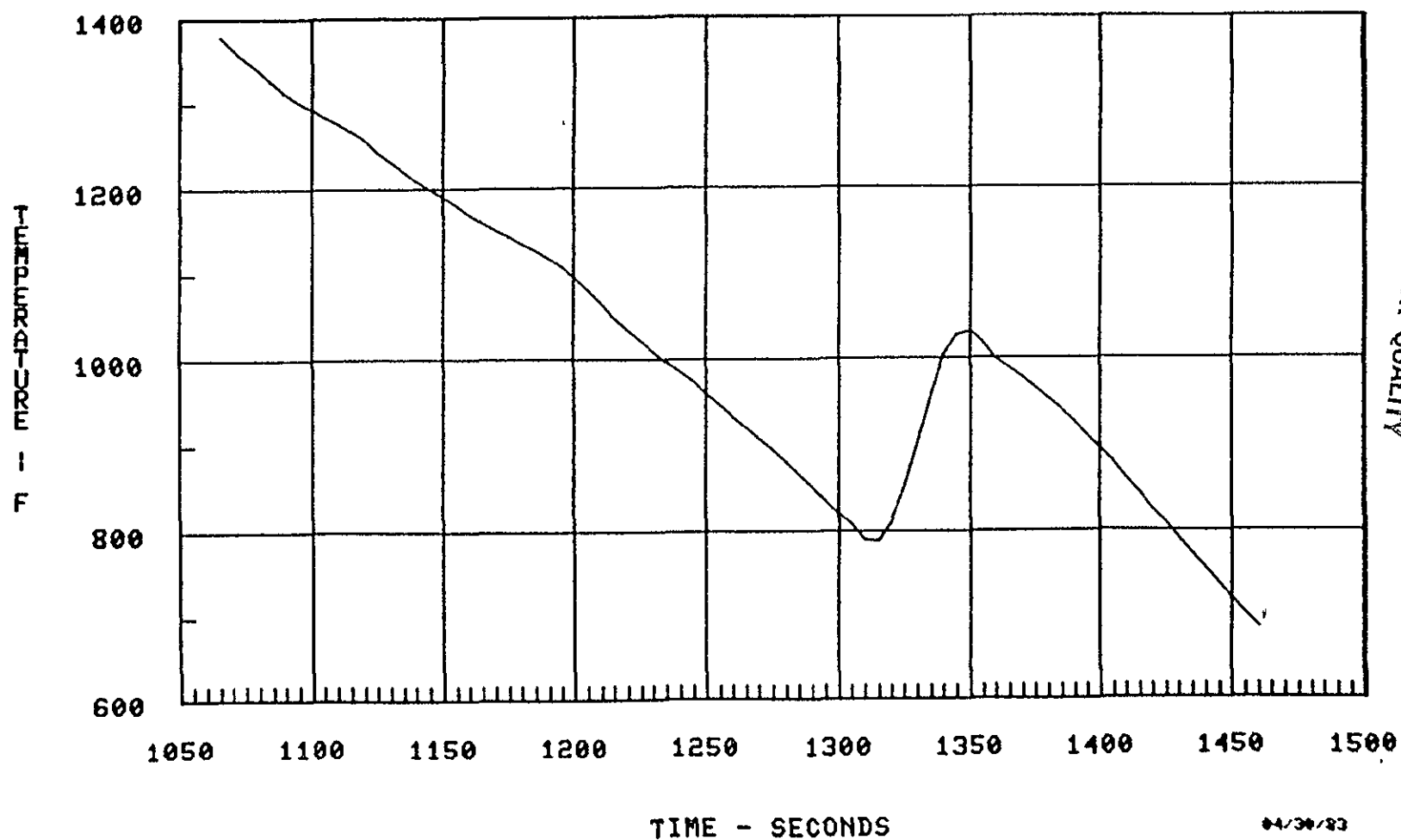
HEIGHTS REF - ALTITUDE - GMS



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# STS-1 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

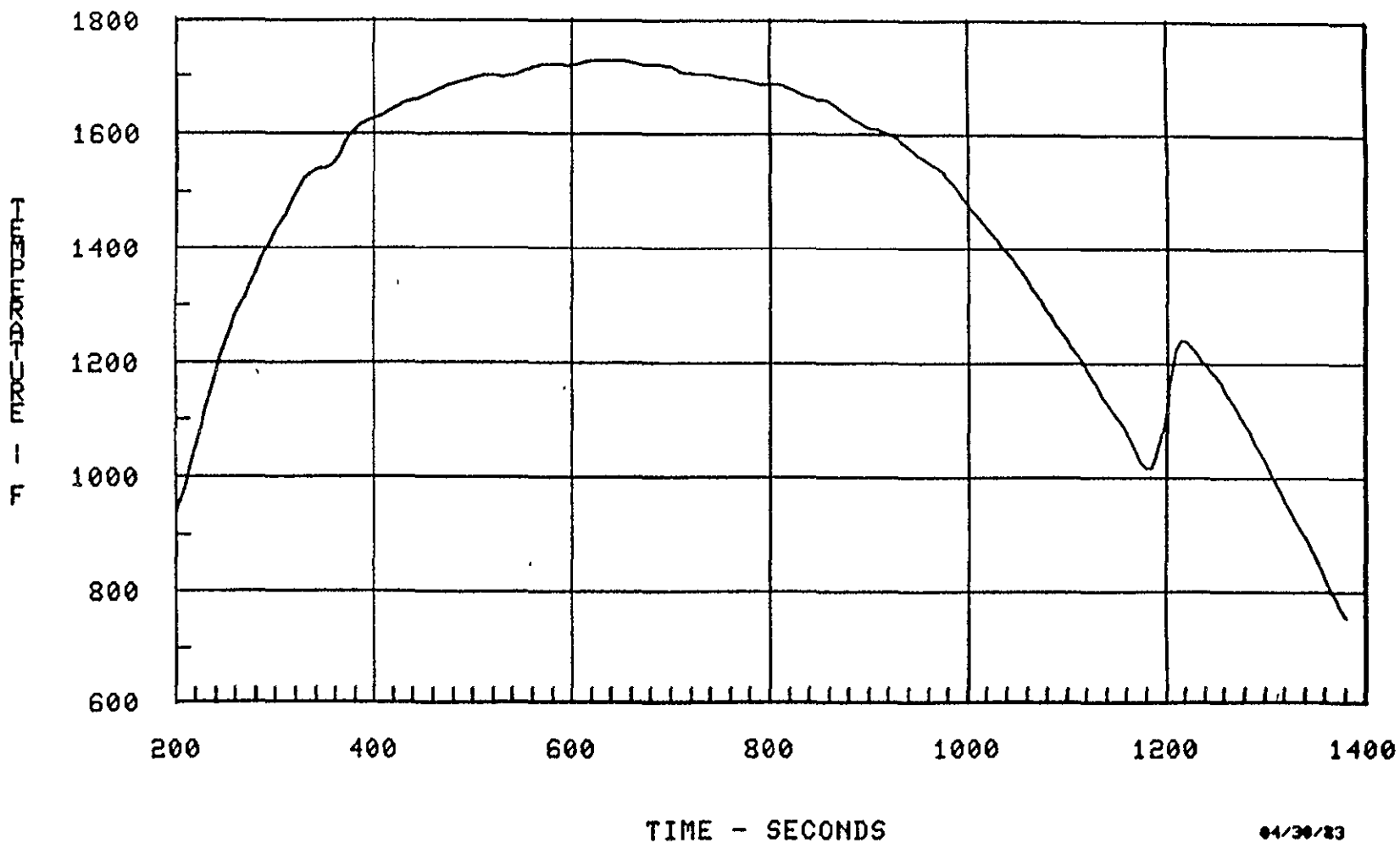
U87T9462A



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# STS-3 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISON

U07T9462A



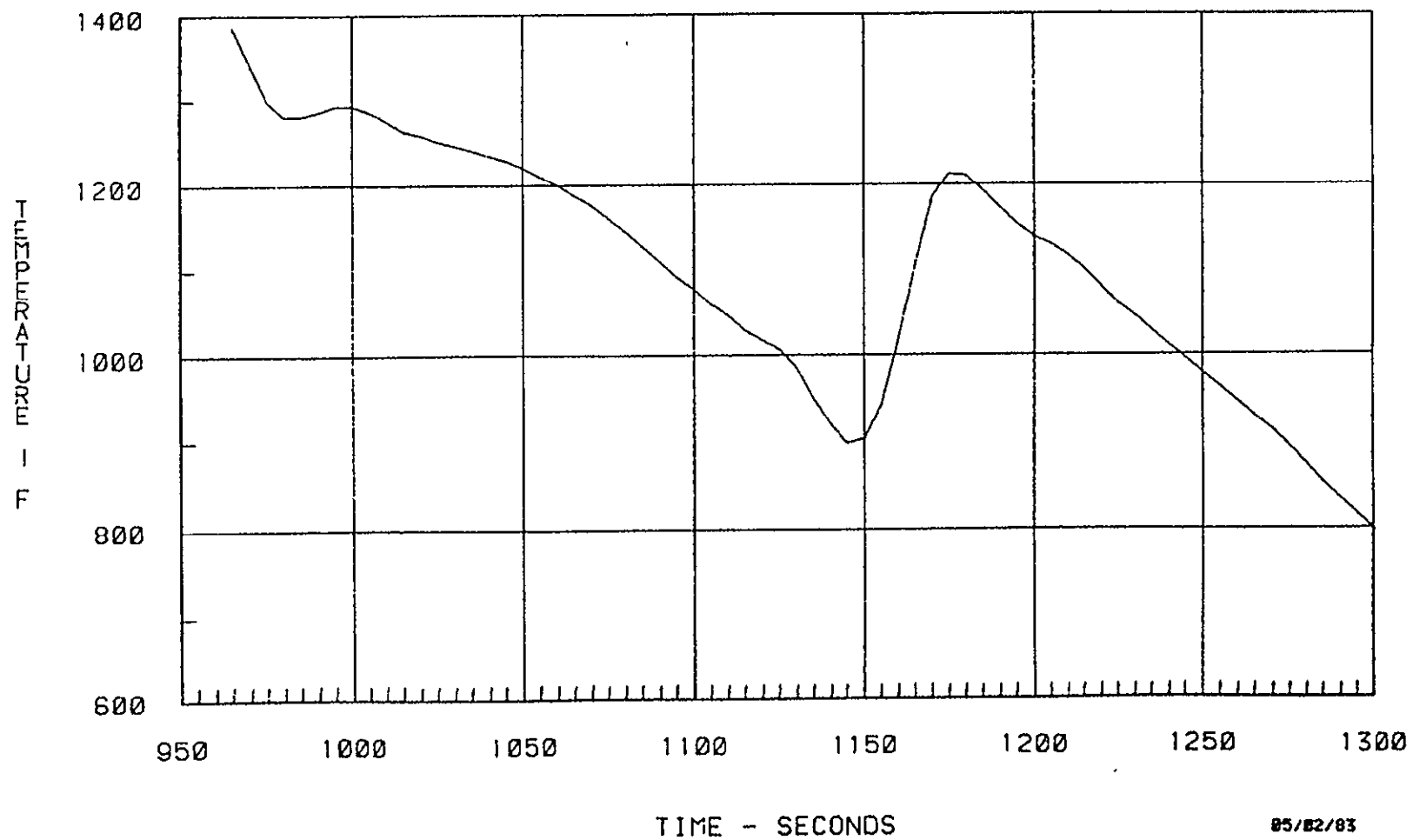
B-68

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04/30/83

# STS-4 (107 FT LENGTH CL $X/L=0.14$ ) FLIGHT PARAMETER COMPARISO

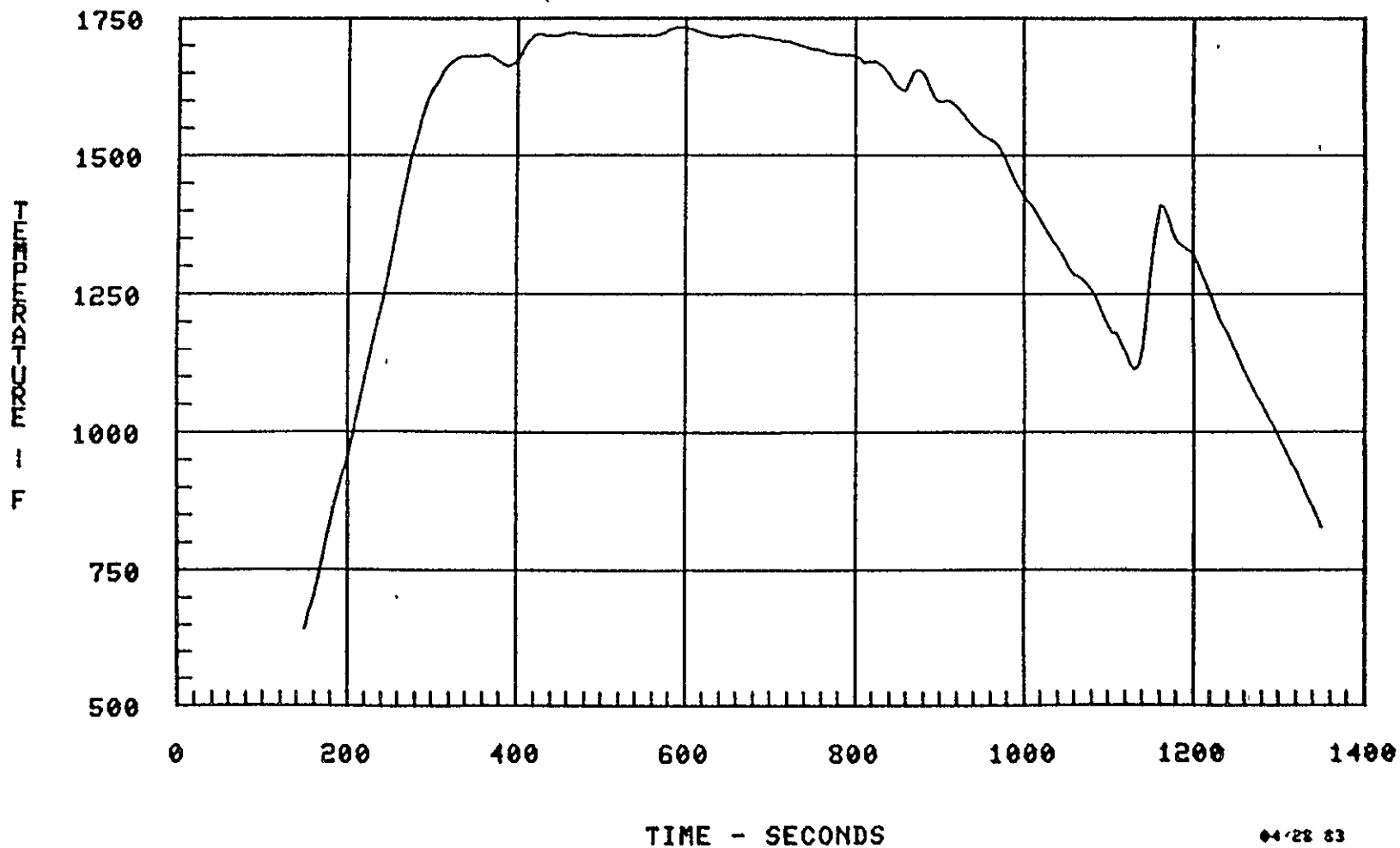
V07T9462A



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# STS-5 (107 FT LENGTH CL X/L=0.14) FLIGHT PARAMETER COMPARISO

U87T9462A



B-70

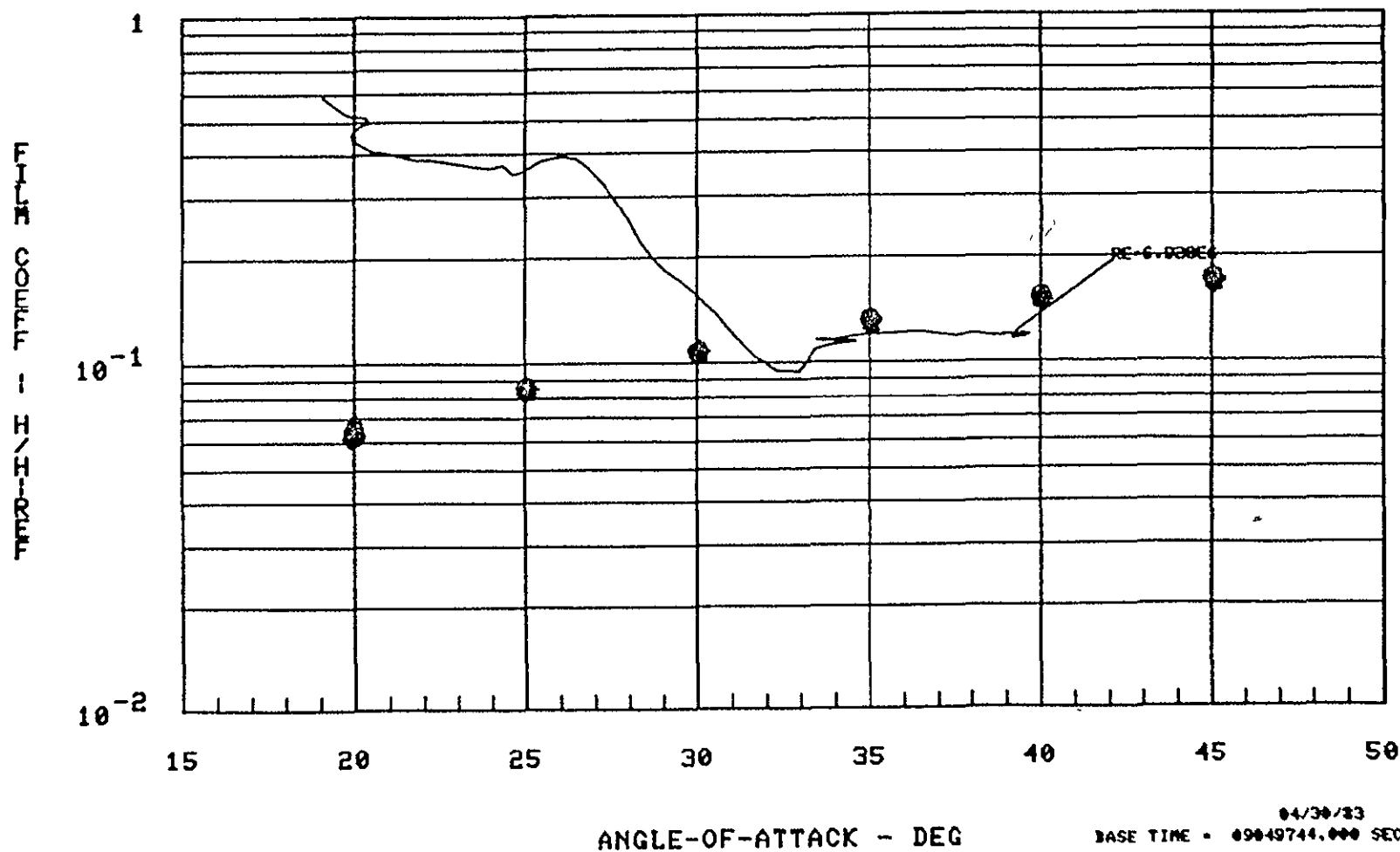
ORIGINAL PAGE IS  
OF POOR QUALITY

# STS-1 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9463A/H-REF 1065-1460 SEC



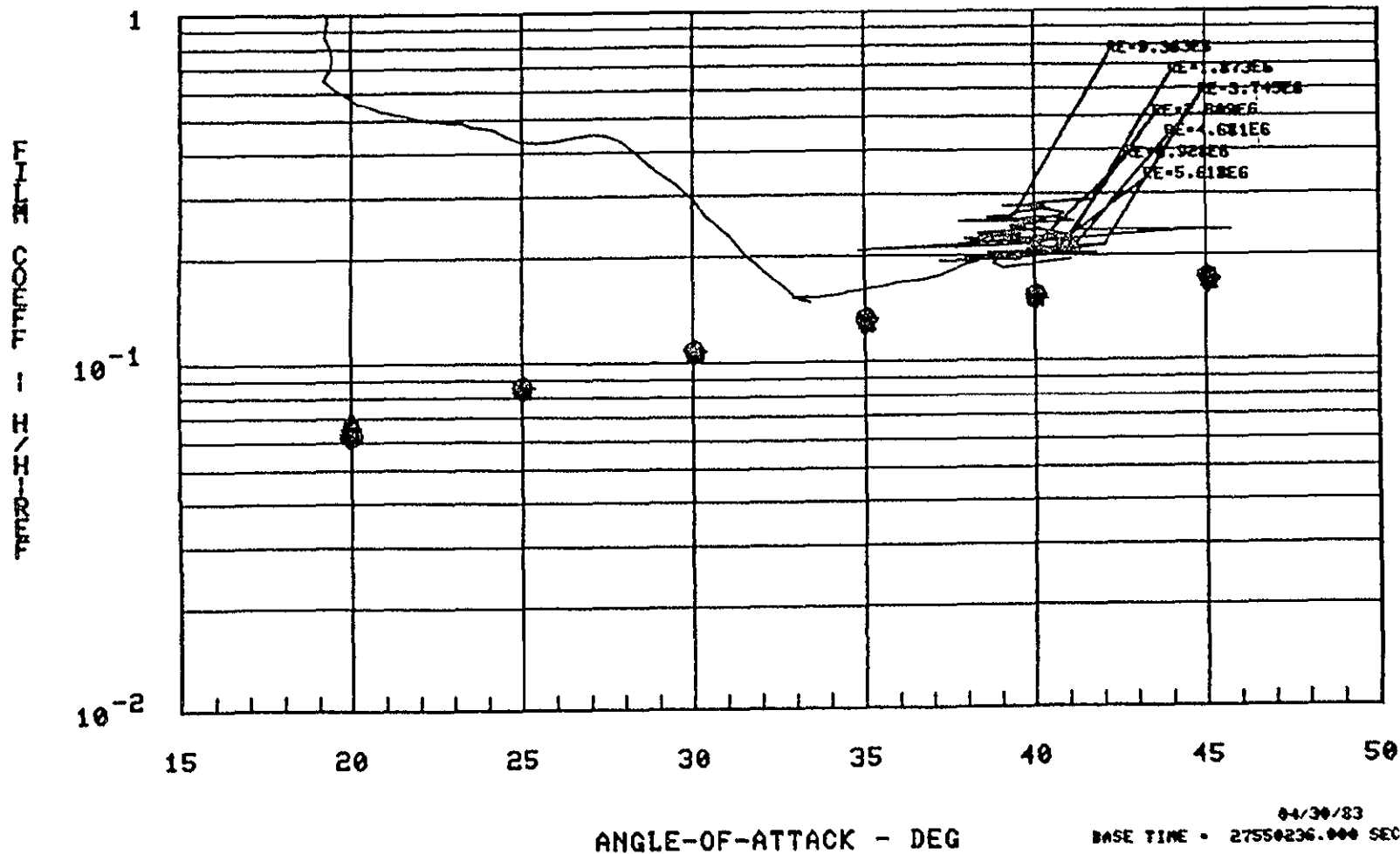
ORIGINAL PAGE IS  
OF POOR QUALITY

# STS-2 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
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×  
+

OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U07T9463A/H-REF 200-1480 SEC



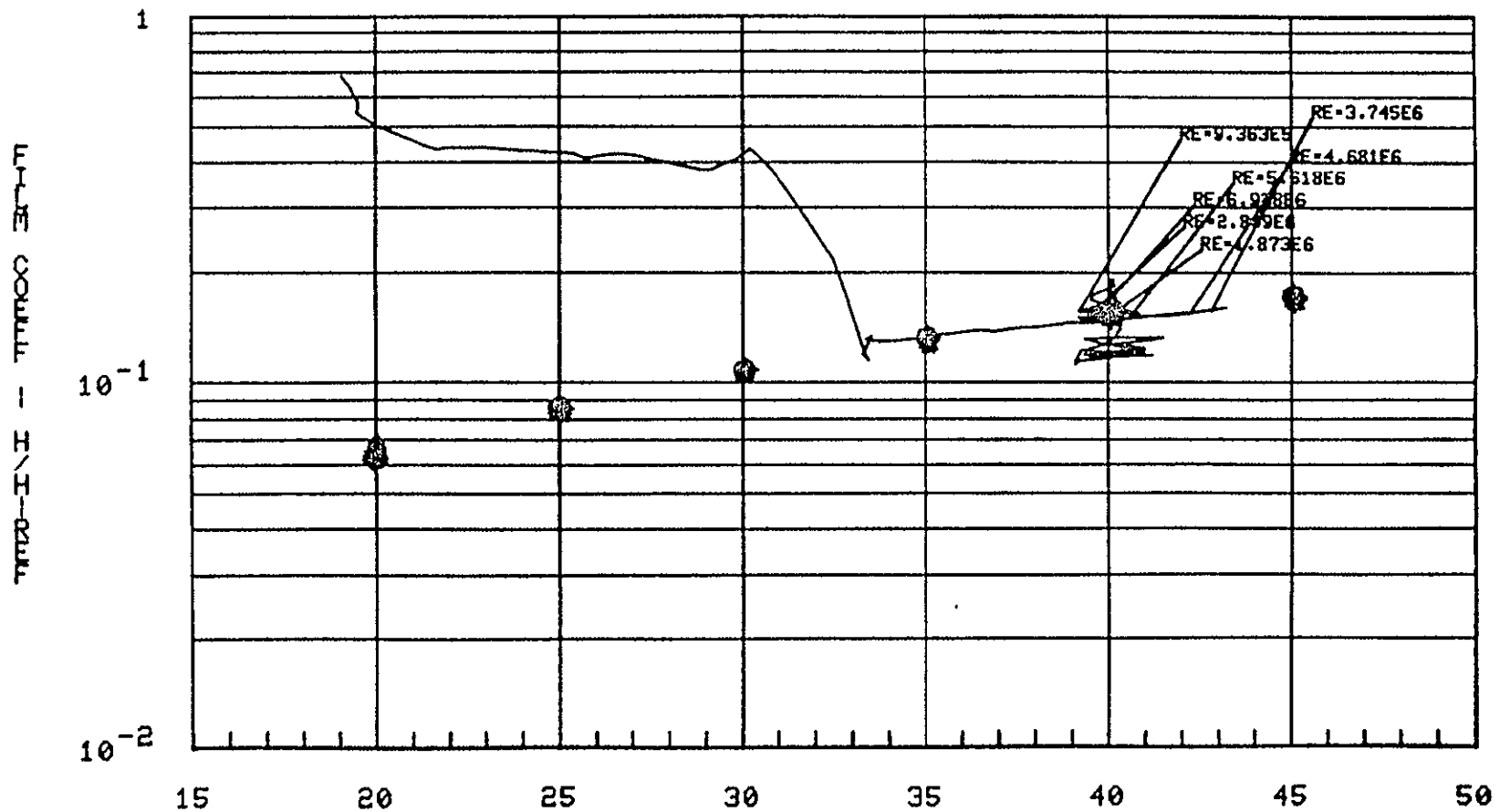


# STS-3 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
□  
△  
▽  
△  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9463A/H-REF 200-1380 SEC



LIFT COEFF - I/I-0.001

ANGLE-OF-ATTACK - DEG

04/30/83  
BASE TIME = 07745684.000 SEC.

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OF POOR QUALITY

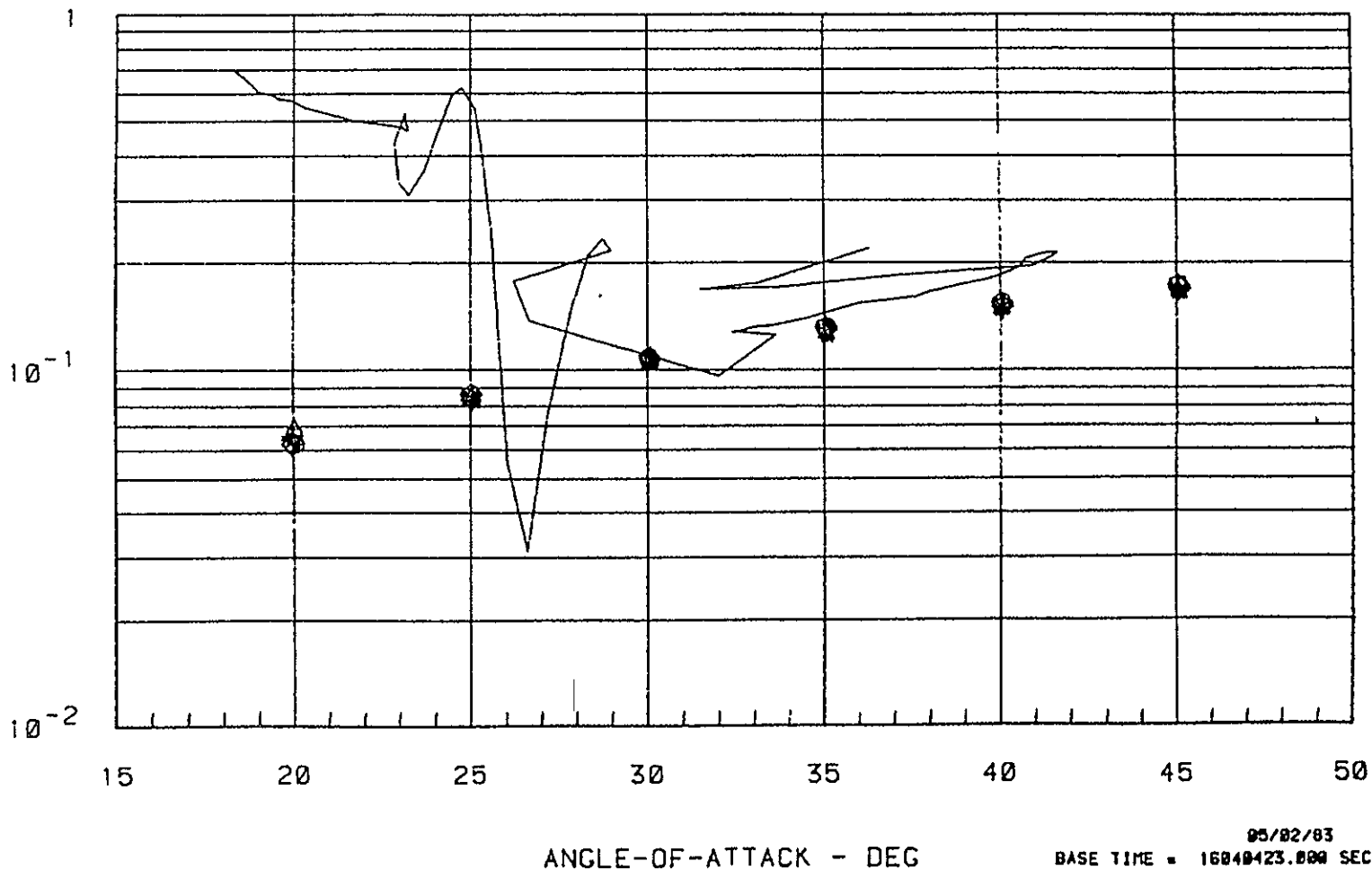
# STS-4 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
◇  
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×  
+

OH49 0 0175 SCALE RE = 0.5 E06  
OH49 0 0175 SCALE RE = 1.0 E06  
OH49 0 0175 SCALE RE = 1.5 E06  
OH49 0 0175 SCALE RE = 2.0 E06  
OH49 0 0175 SCALE RE = 2.5 E06  
OH49 0 0175 SCALE RE = 3.0 E06  
OH49 0 0175 SCALE RE = 3.7 E06

V07T0463A/H-REF 965-1300 SEC

LINE COULTE - INT-0000



B-74

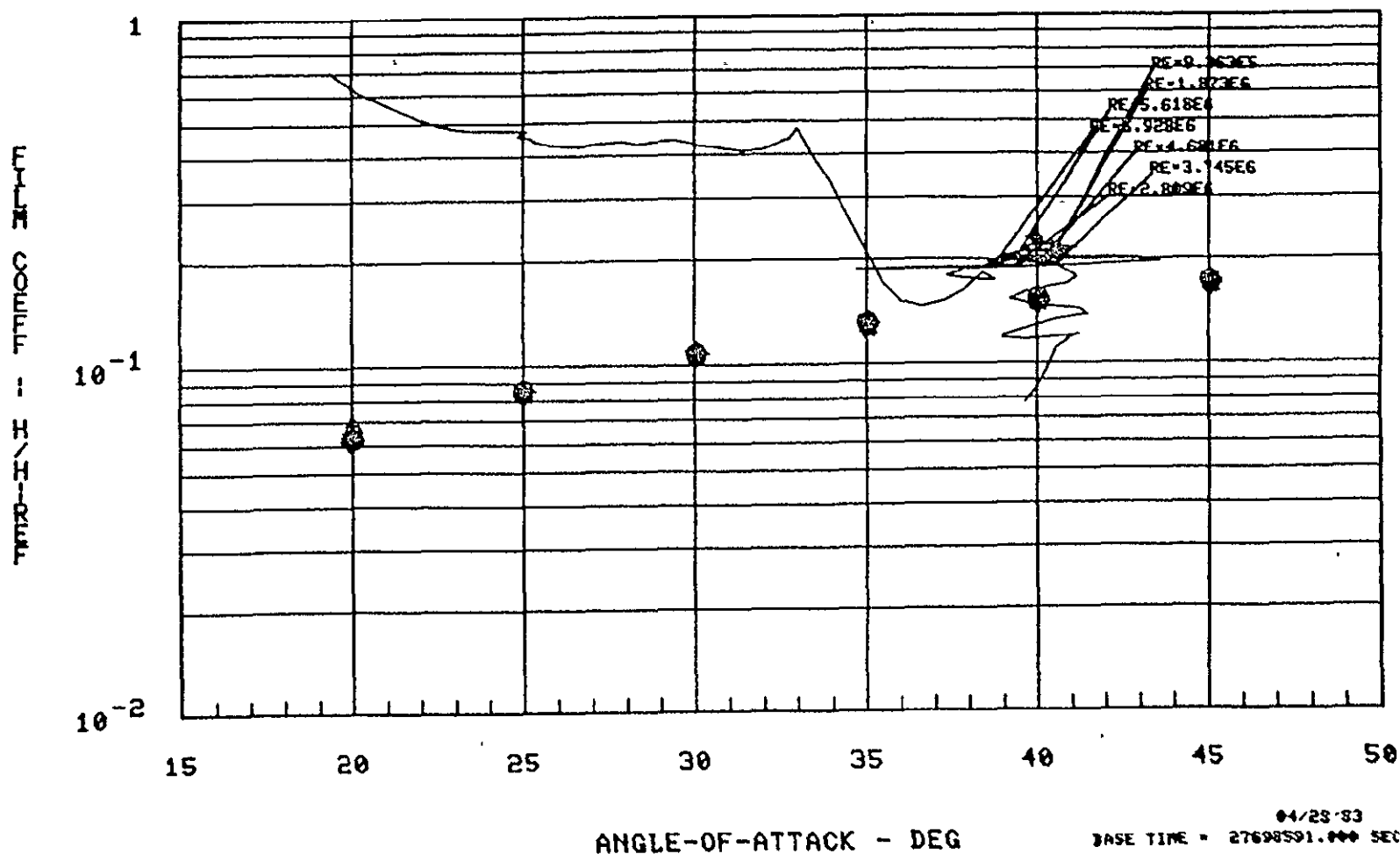
ORIGINAL PAGE IS  
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# STS-5 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
★  
+

OH49 0.0175 SCALE RE \* 0.5 E06  
OH49 0.0175 SCALE RE \* 1.0 E06  
OH49 0.0175 SCALE RE \* 1.5 E06  
OH49 0.0175 SCALE RE \* 2.0 E06  
OH49 0.0175 SCALE RE \* 2.5 E06  
OH49 0.0175 SCALE RE \* 3.0 E06  
OH49 0.0175 SCALE RE \* 3.7 E06

U07T9463A/H-REF 150-1350 SEC



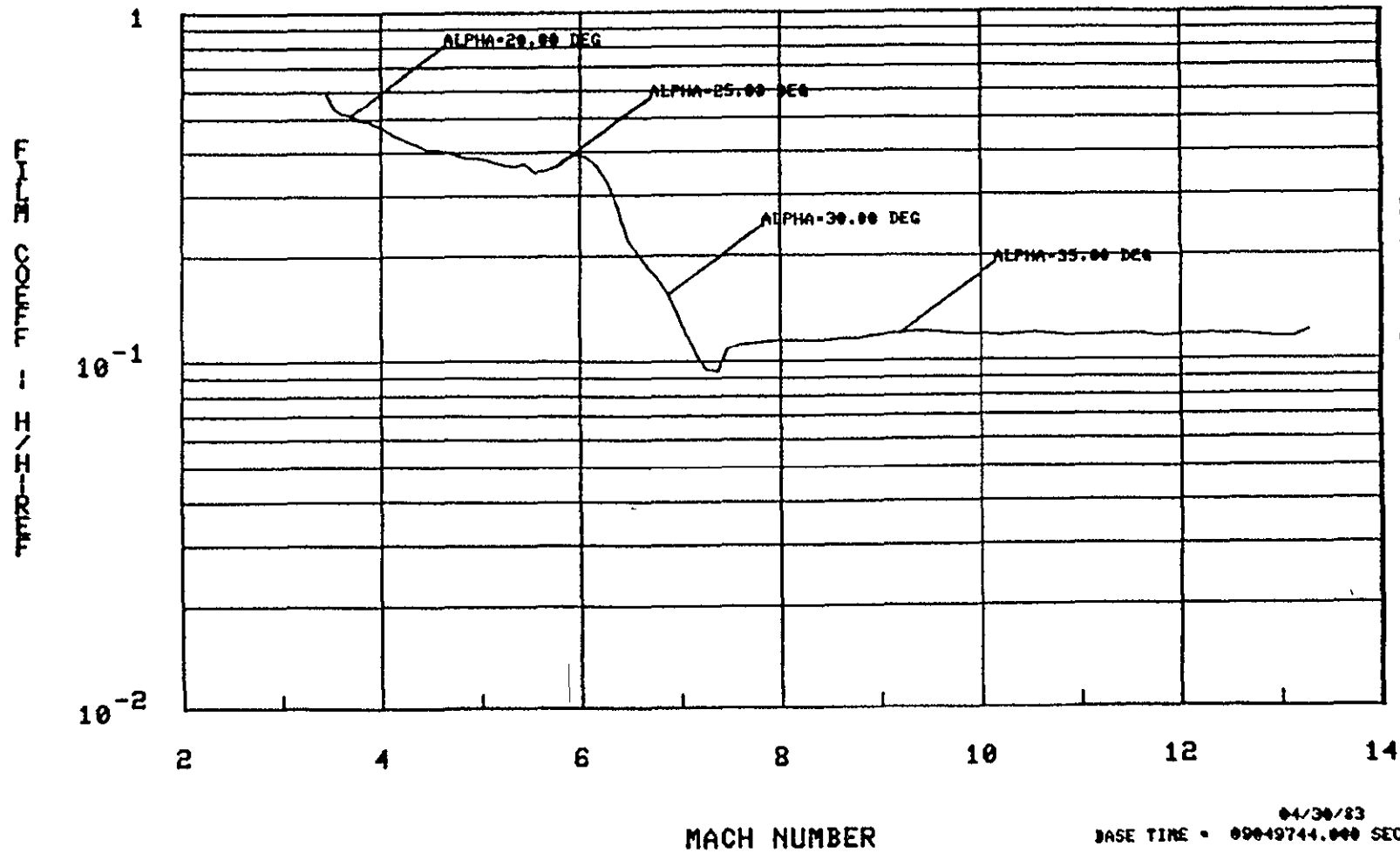
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B-75

04/23/83  
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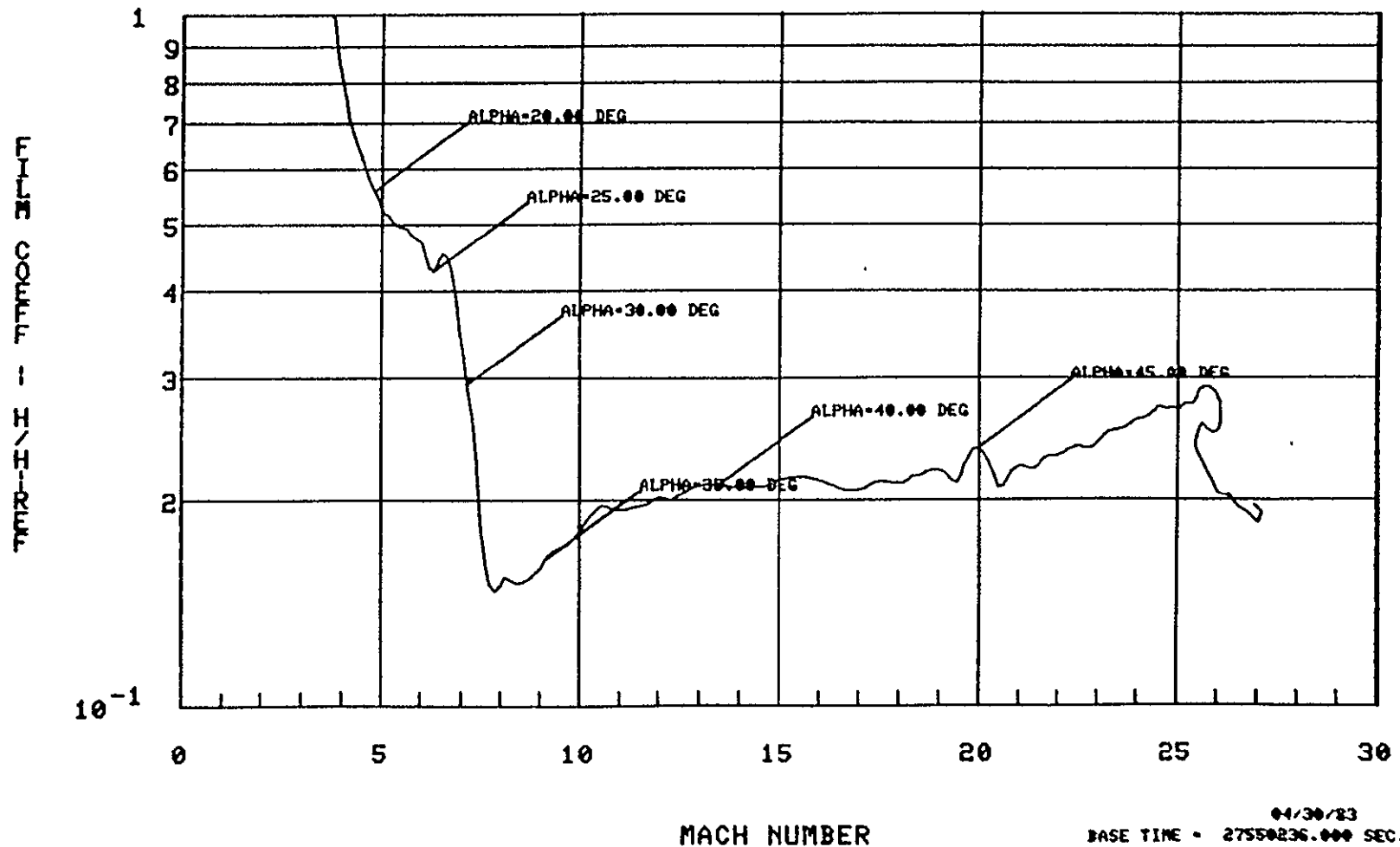
# STS-1 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

U07T9463A/H-REF 1065-1460 SEC



# STS-2 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

U07T9463A/H-REF 200-1480 SEC

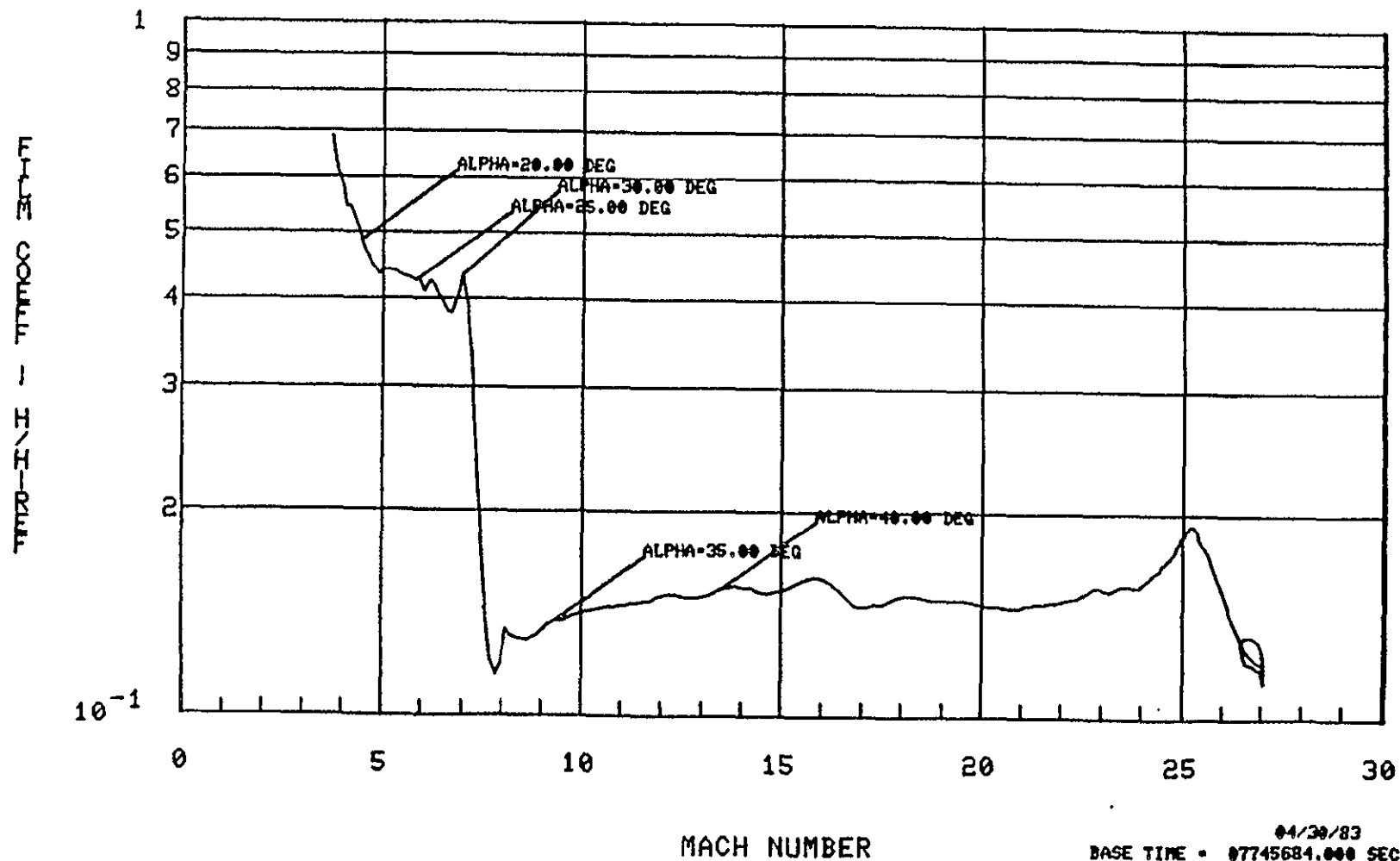


B-77

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# STS-3 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISON

U07T9463A/H-REF 200-1380 SEC



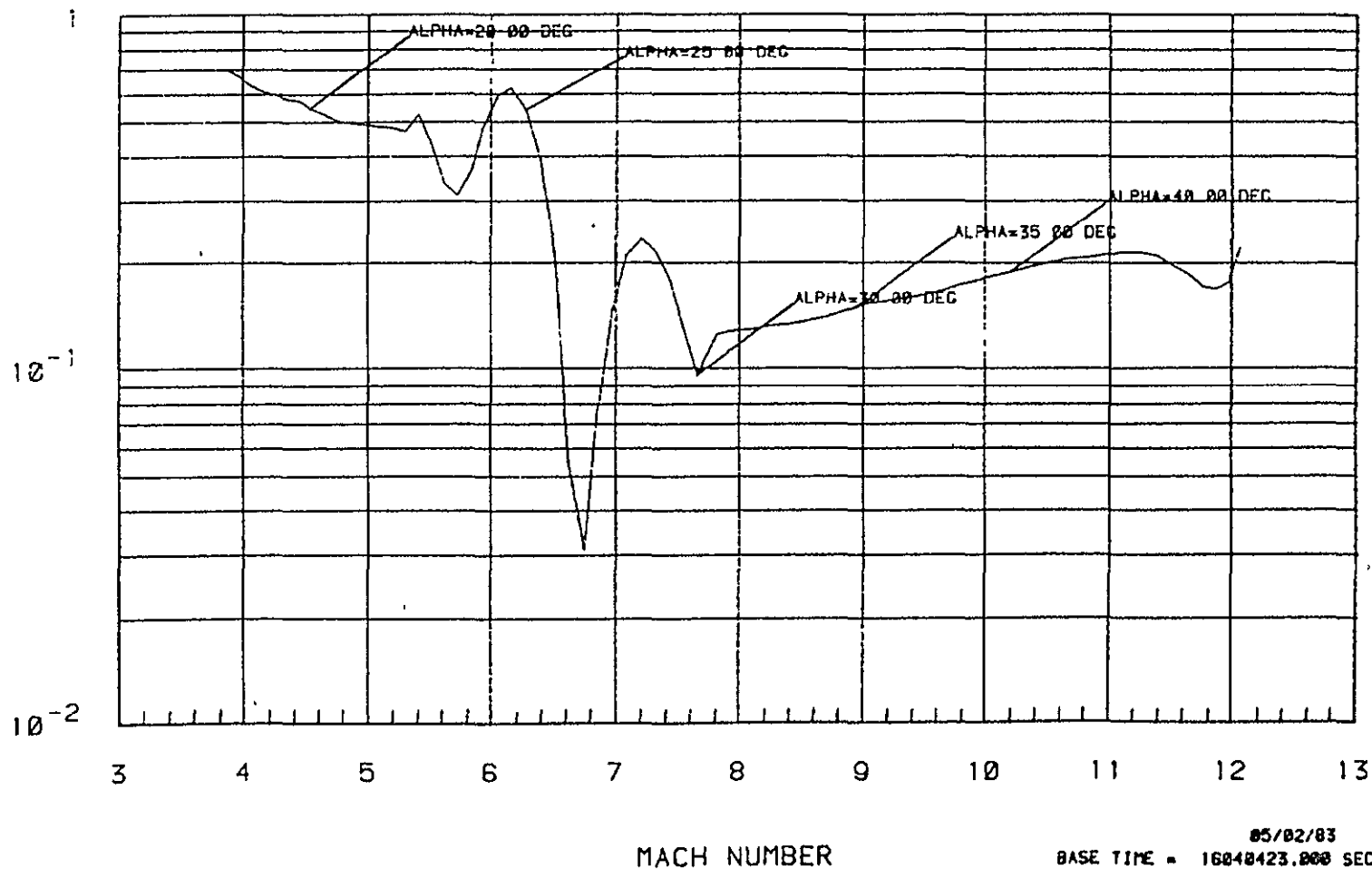
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V07T0463A/H-REF 065-1300 SEC

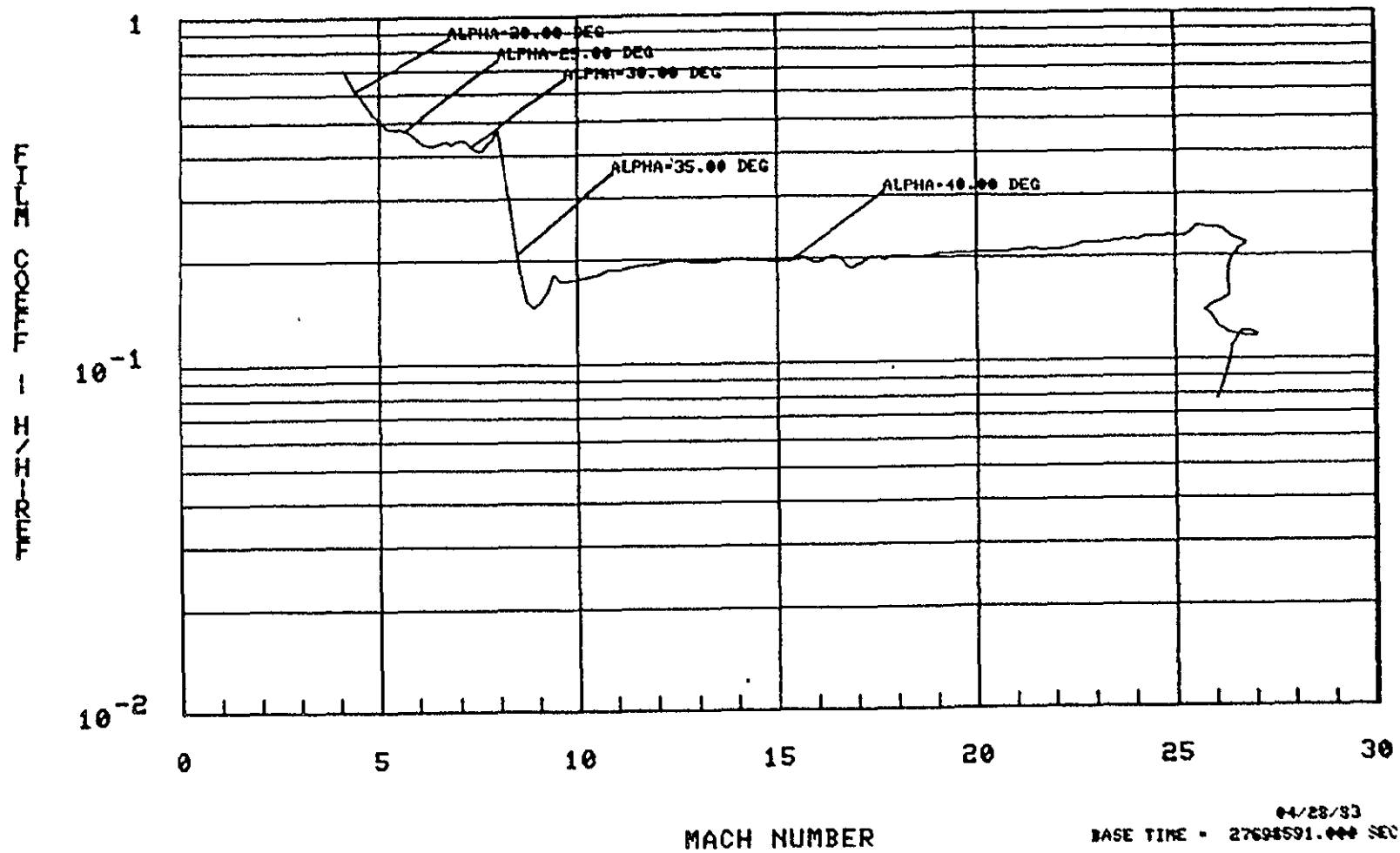
WALL CORRELATION - H/I-0000

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# STS-5 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

U07T9463A/H-REF 150-1350 SEC



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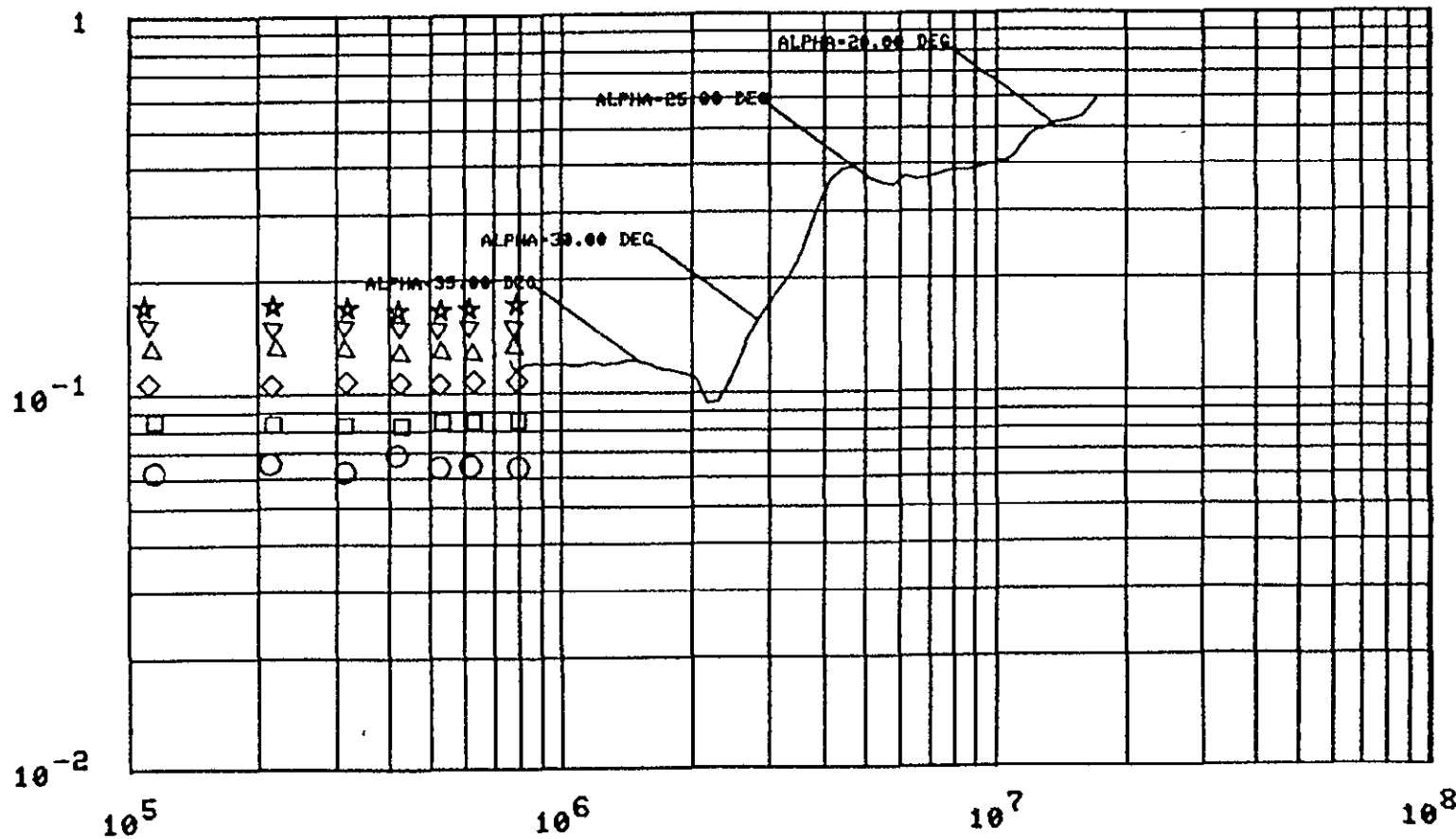
# STS-1 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

○  
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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9463A/H-REF 1065-1460 SEC

FLIGHT COEFFICIENT - H/H-REF



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B-81

REYNOLDS NUMBER (NS)

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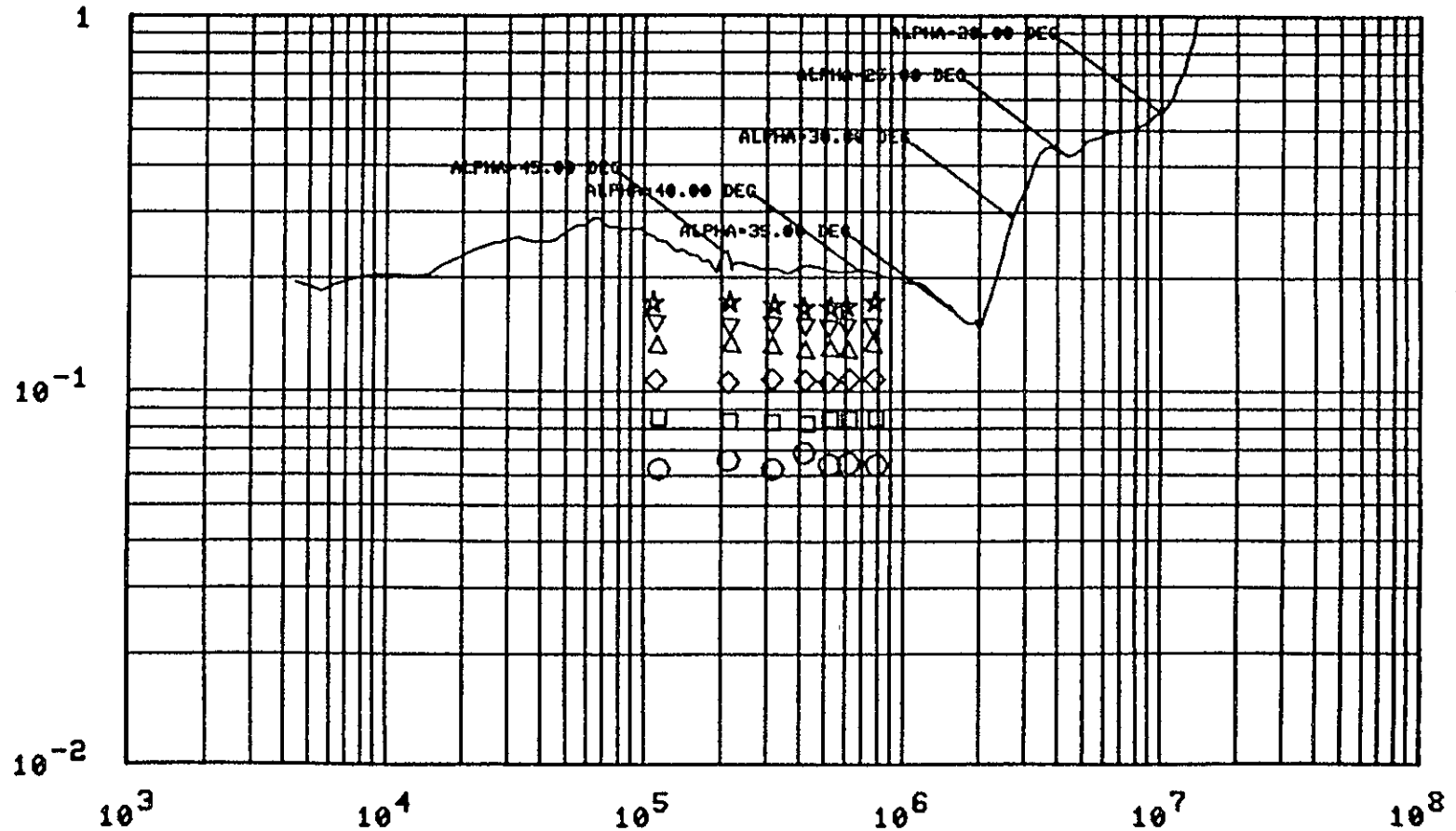
# STS-2 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9463A/H-REF 200-1480 SEC

WALL COEFF - I/I-REF



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REYNOLDS NUMBER (NS)

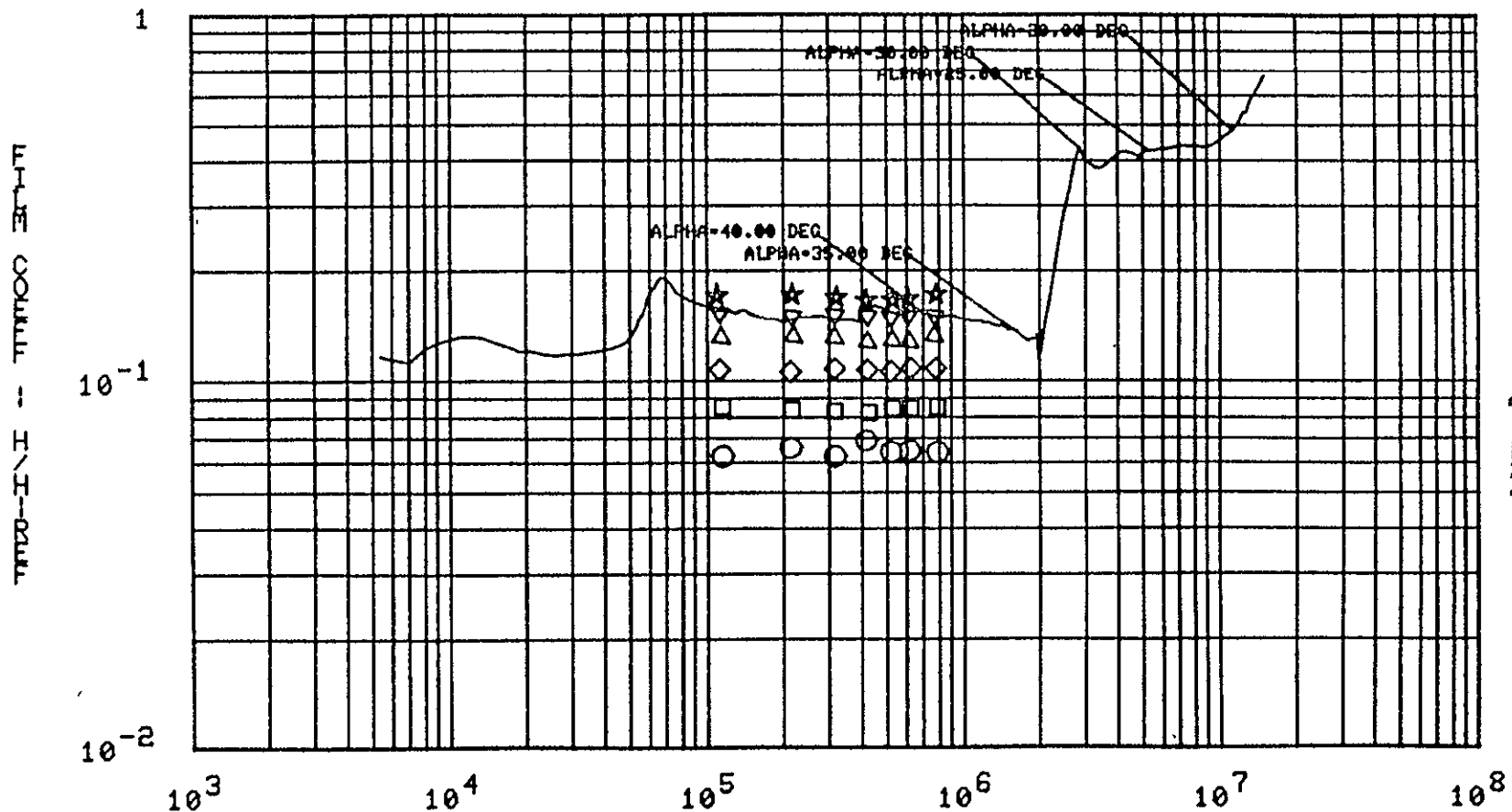
04/30/83  
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# STS-3 (107 FT LENGTH CL $X/L=0.16$ ) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9463A/H-REF 200-1380 SEC



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B-83

REYNOLDS NUMBER (NS)

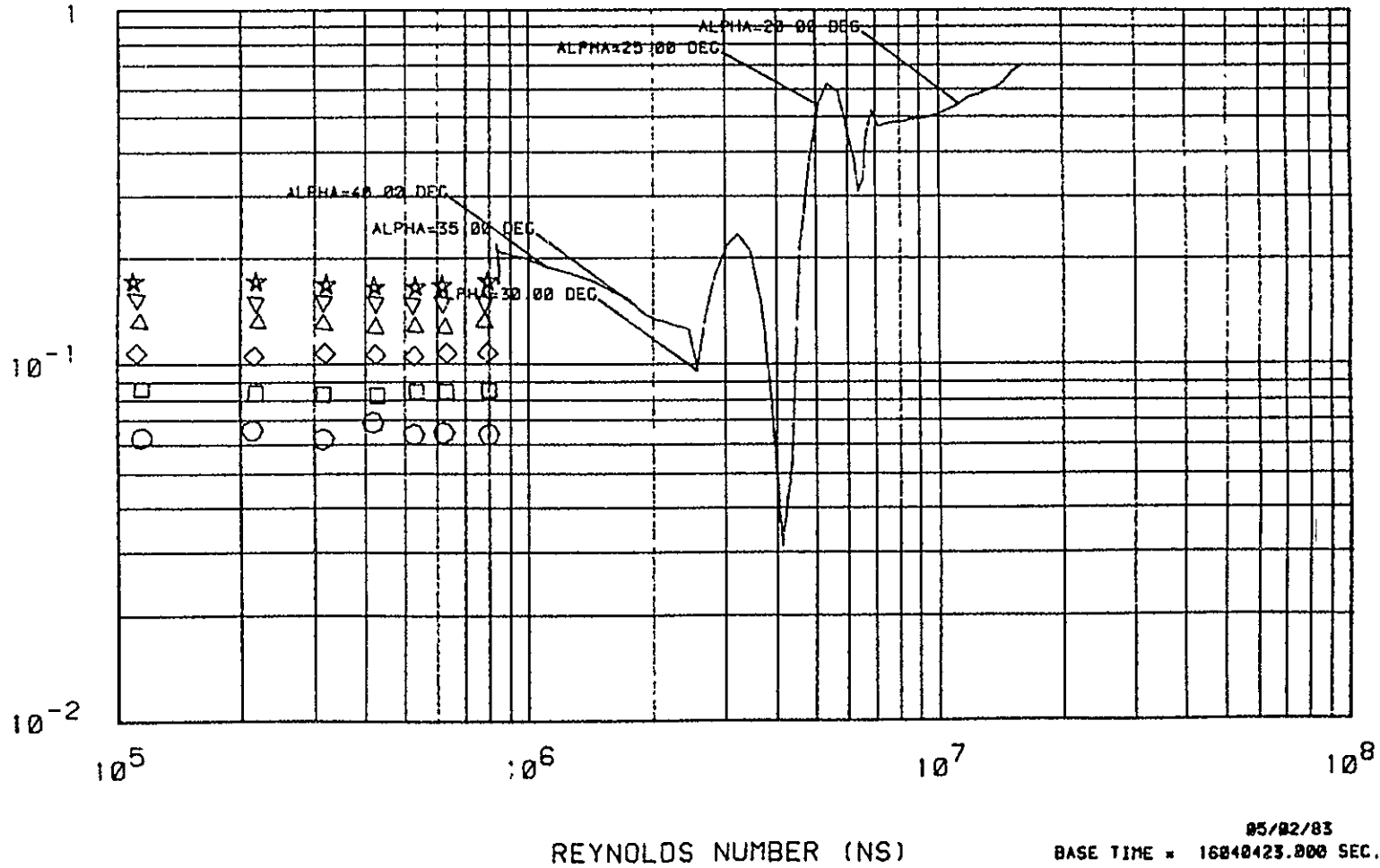
04/30/83  
BASE TIME = 07745684.000 SEC.

# STS-4 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

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OH40 ALPHA = 20 DEGREES  
OH40 ALPHA = 25 DEGREES  
OH40 ALPHA = 30 DEGREES  
OH40 ALPHA = 35 DEGREES  
OH40 ALPHA = 40 DEGREES  
OH40 ALPHA = 45 DEGREES

V07T0463A/H-REF 065-1300 SEC



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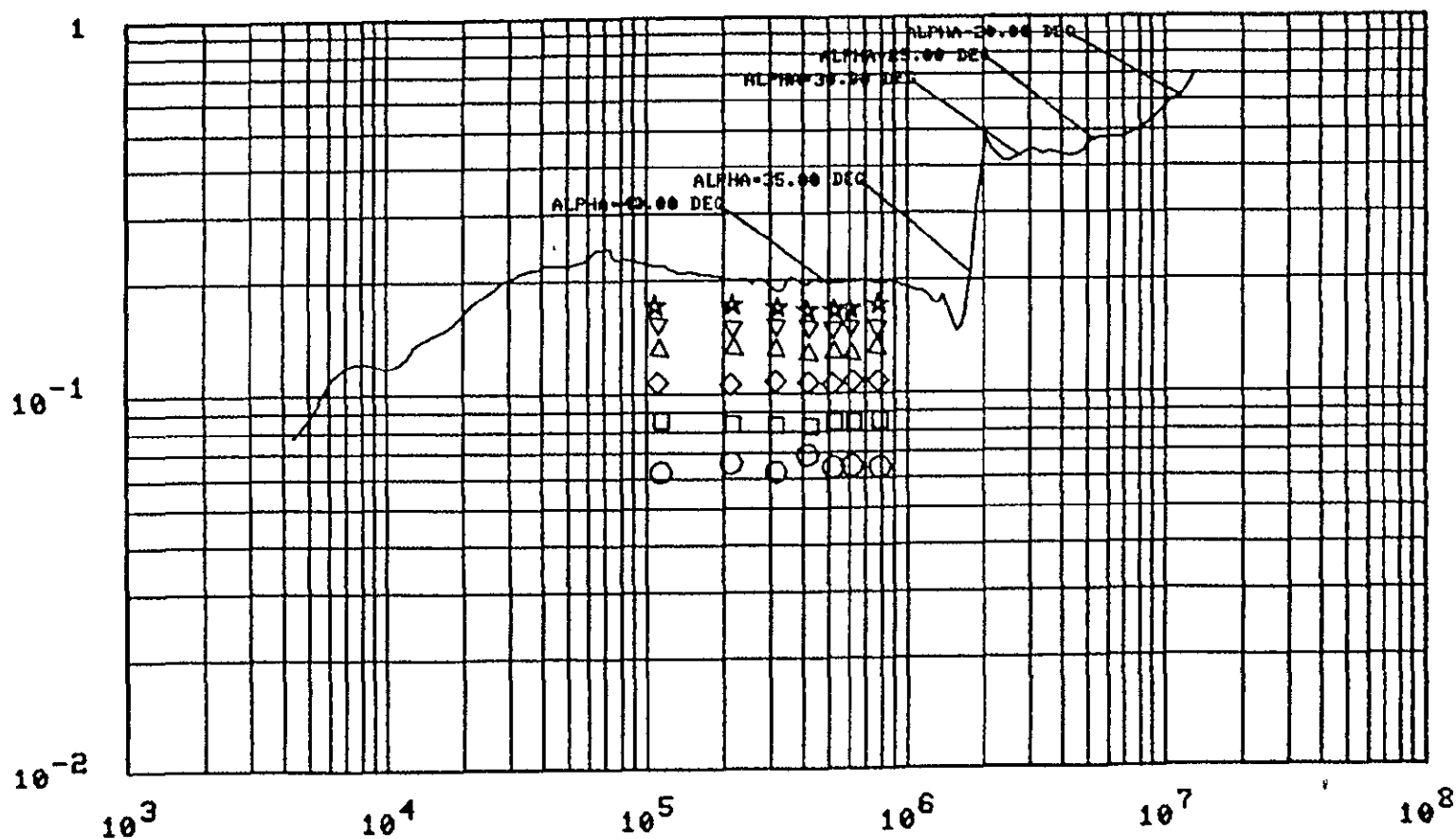
# STS-5 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA • 20 DEGREES  
OH49 ALPHA • 25 DEGREES  
OH49 ALPHA • 30 DEGREES  
OH49 ALPHA • 35 DEGREES  
OH49 ALPHA • 40 DEGREES  
OH49 ALPHA • 45 DEGREES

U07T9463A/H-REF 150-1350 SEC

LINE COULDN'T BE DRAWN



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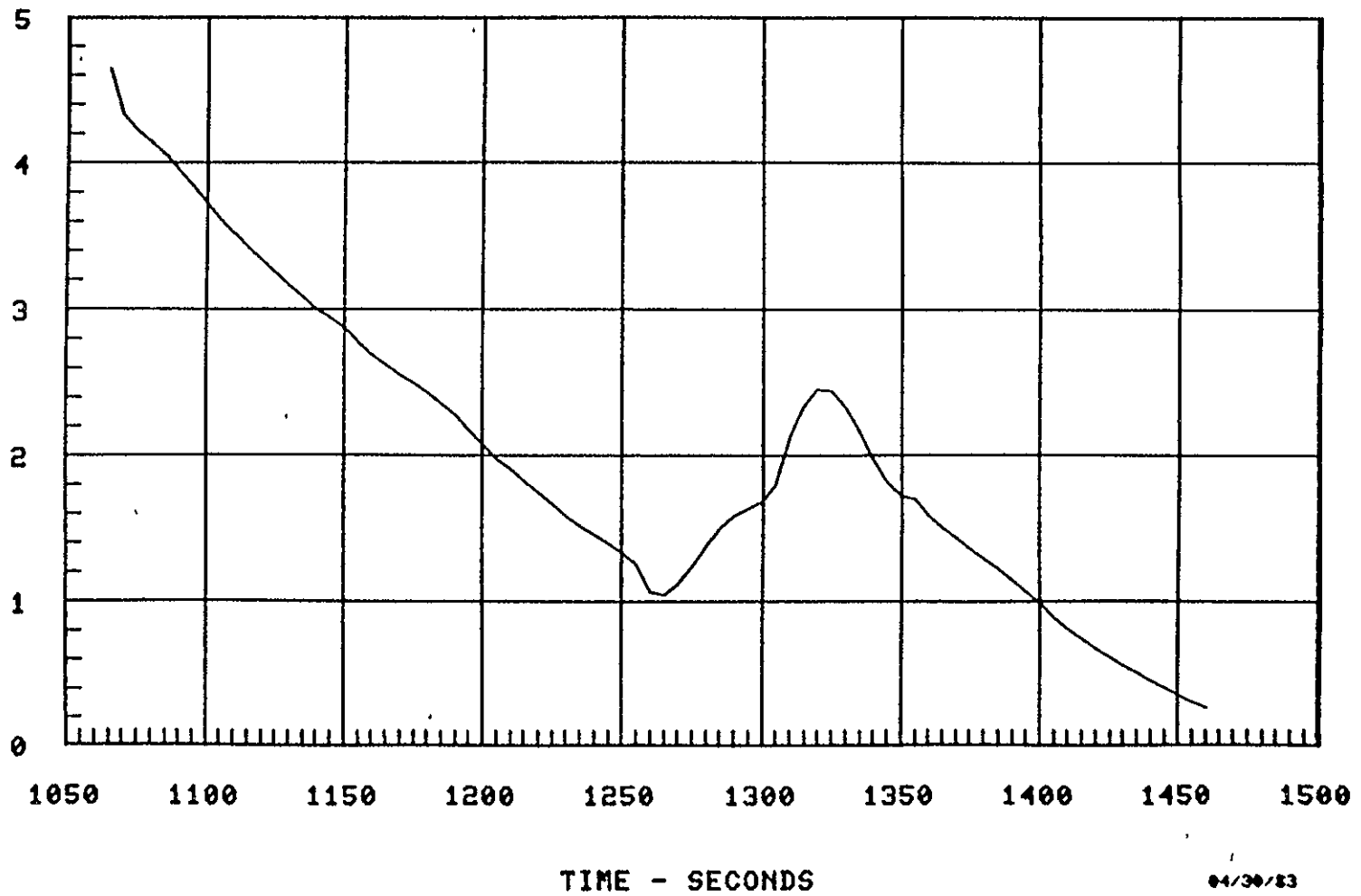
04/28/83  
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U07T9463A

INTEGRATED RESEARCH -- RESEARCH --

B-86



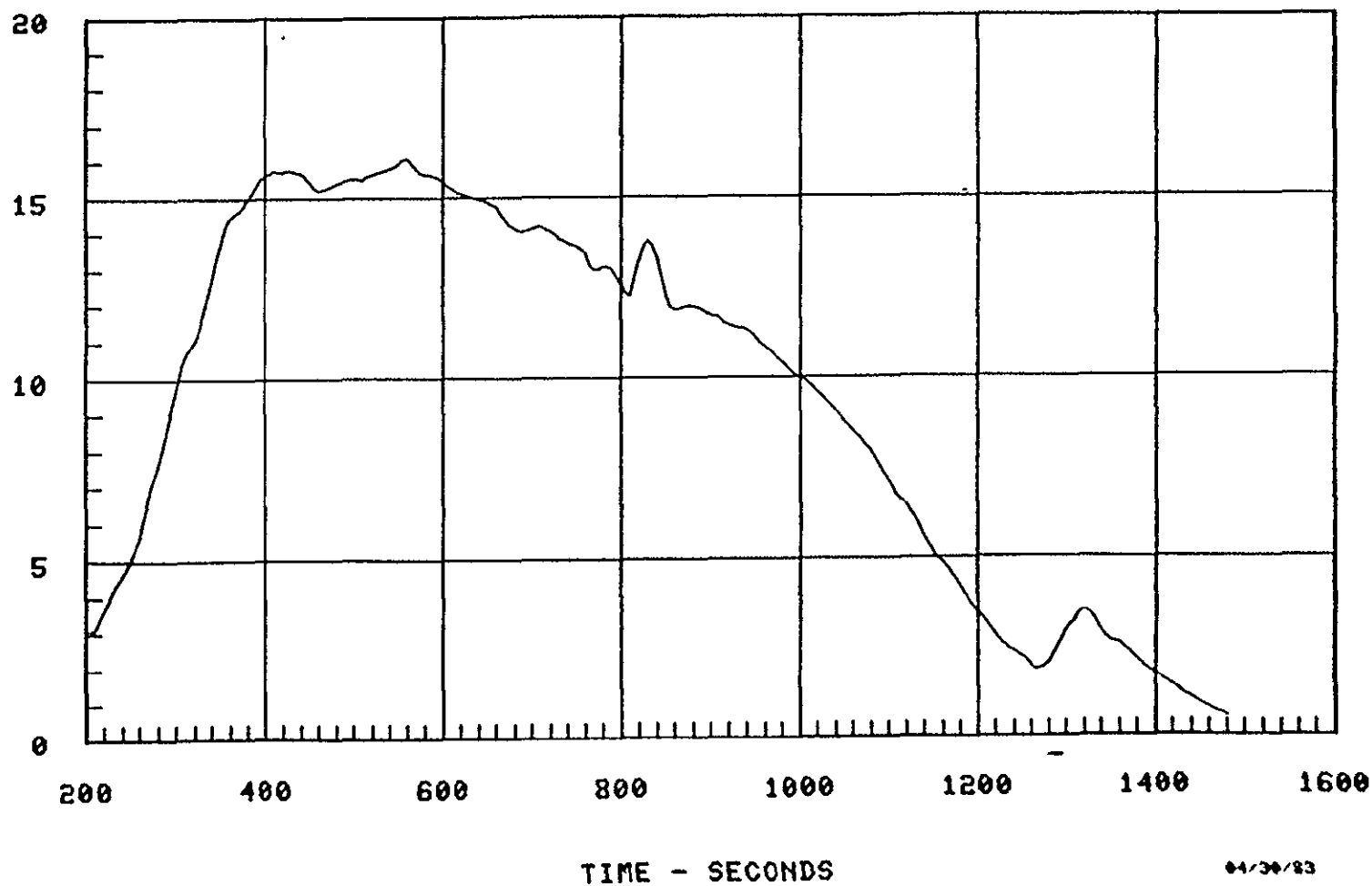
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04/30/83

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U87T9463A

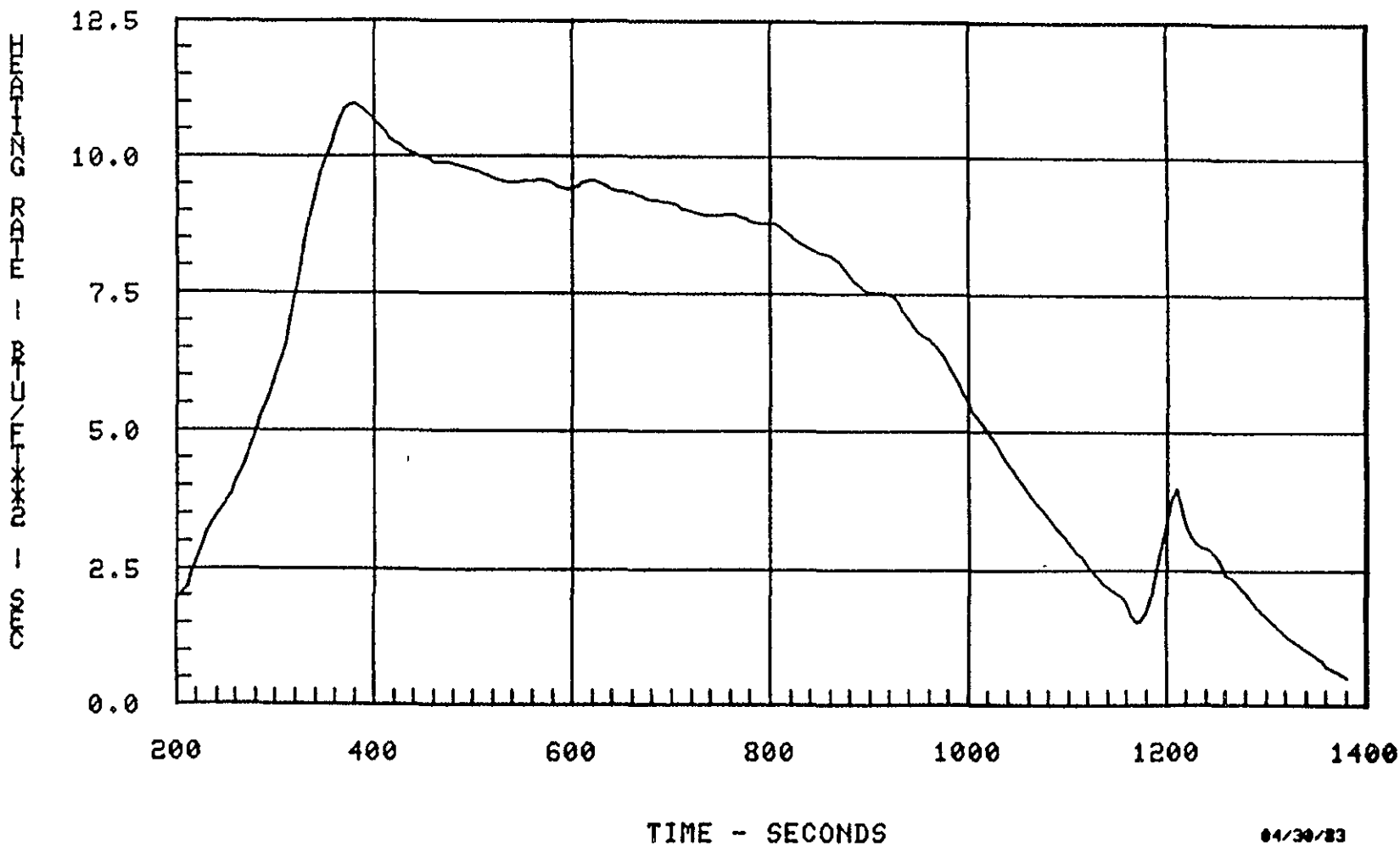
VERTICAL - ALTITUDE - GMS



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# STS-3 (107 FT LENGTH CL $X/L=0.16$ ) FLIGHT PARAMETER COMPARISON

U07T9463A



B-88

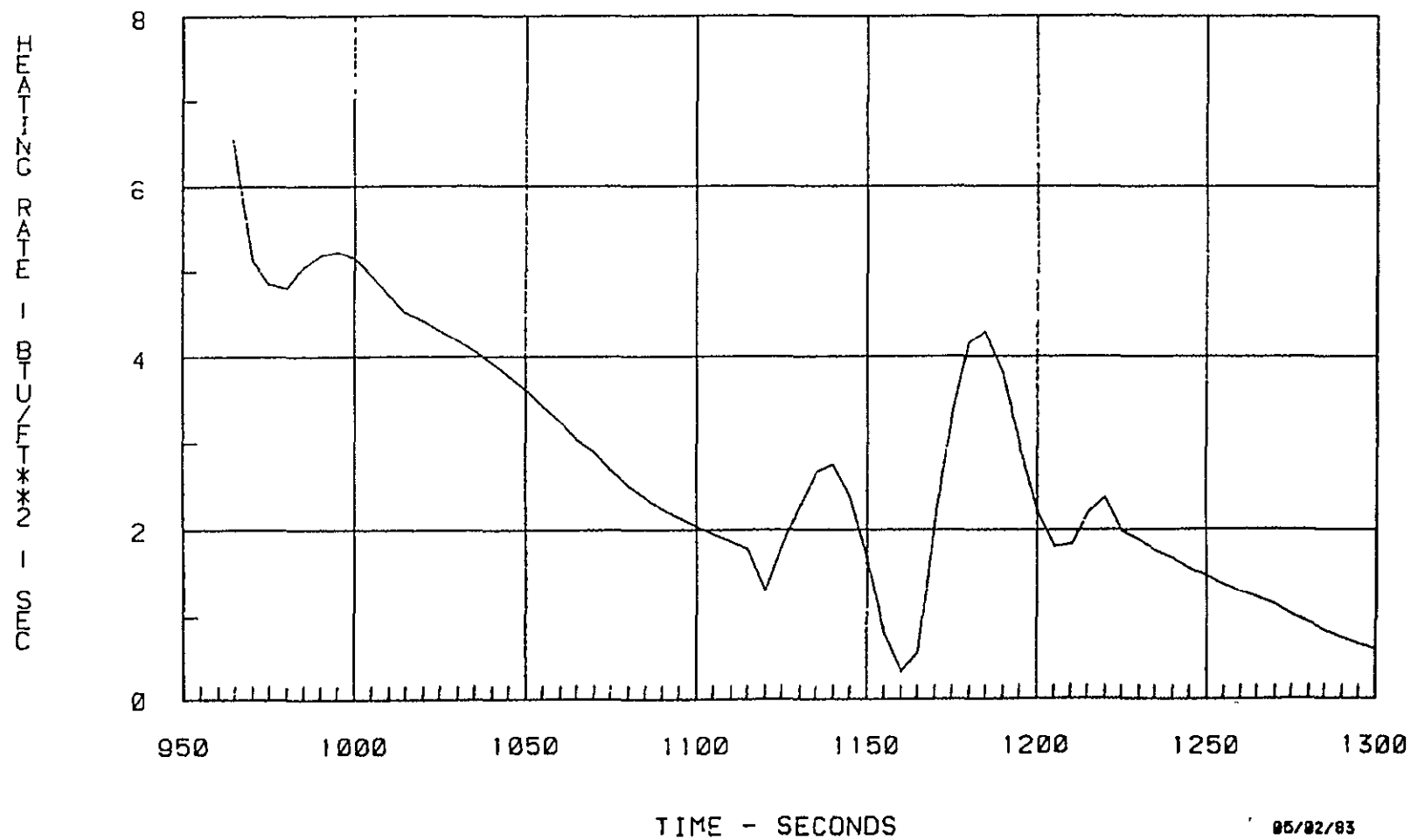
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04/30/83



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———— V07T0463A

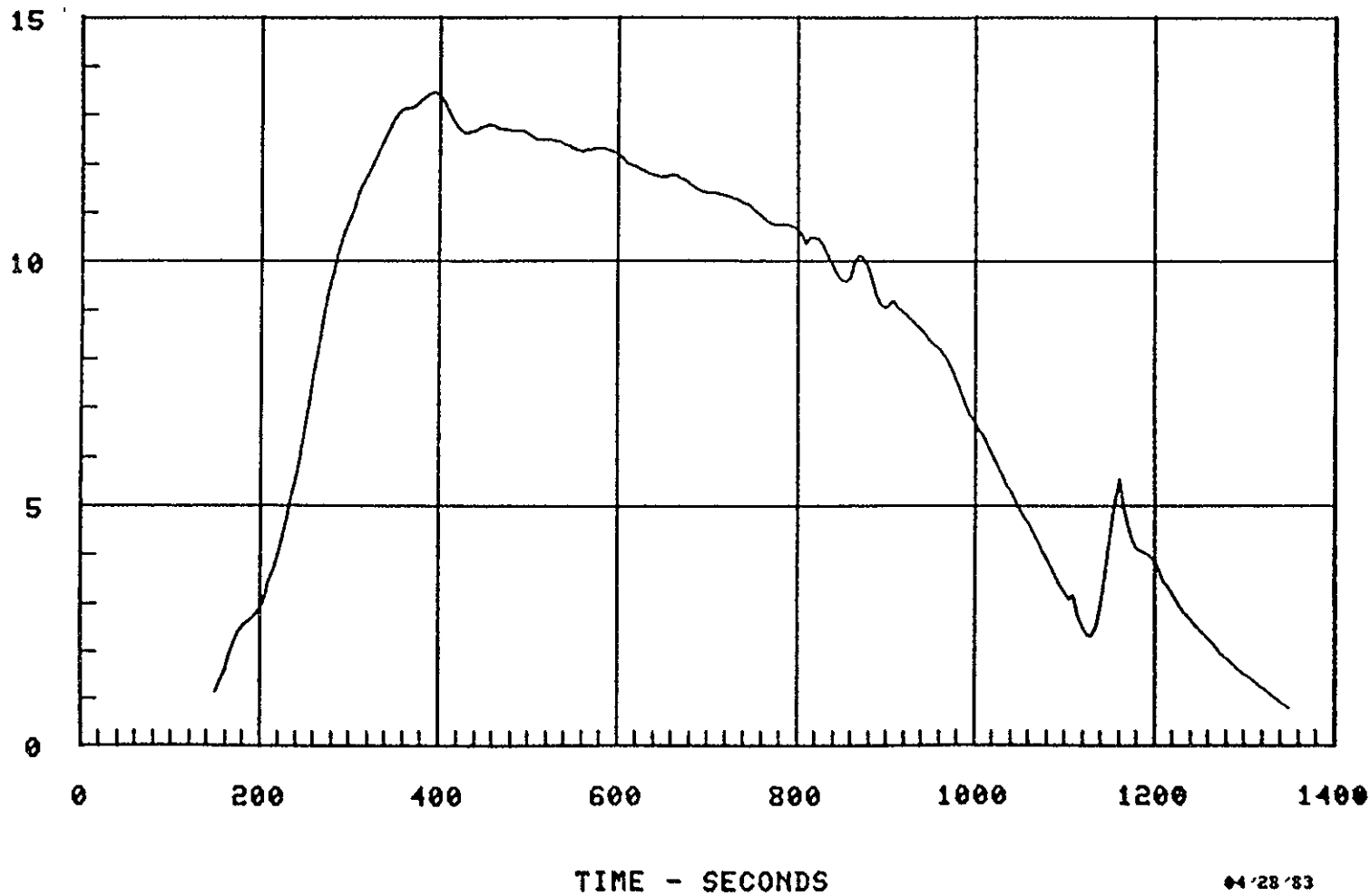


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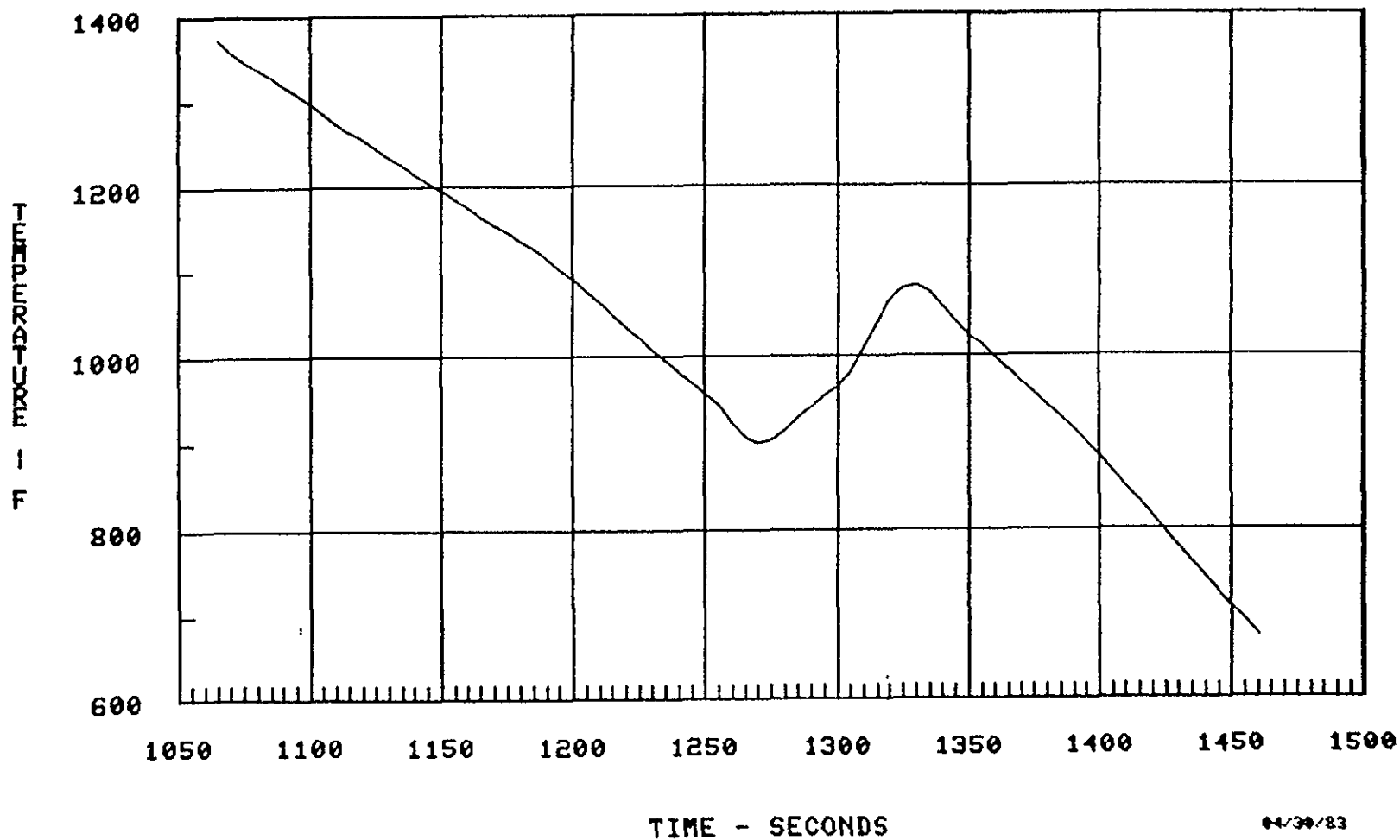
TIME - SECONDS



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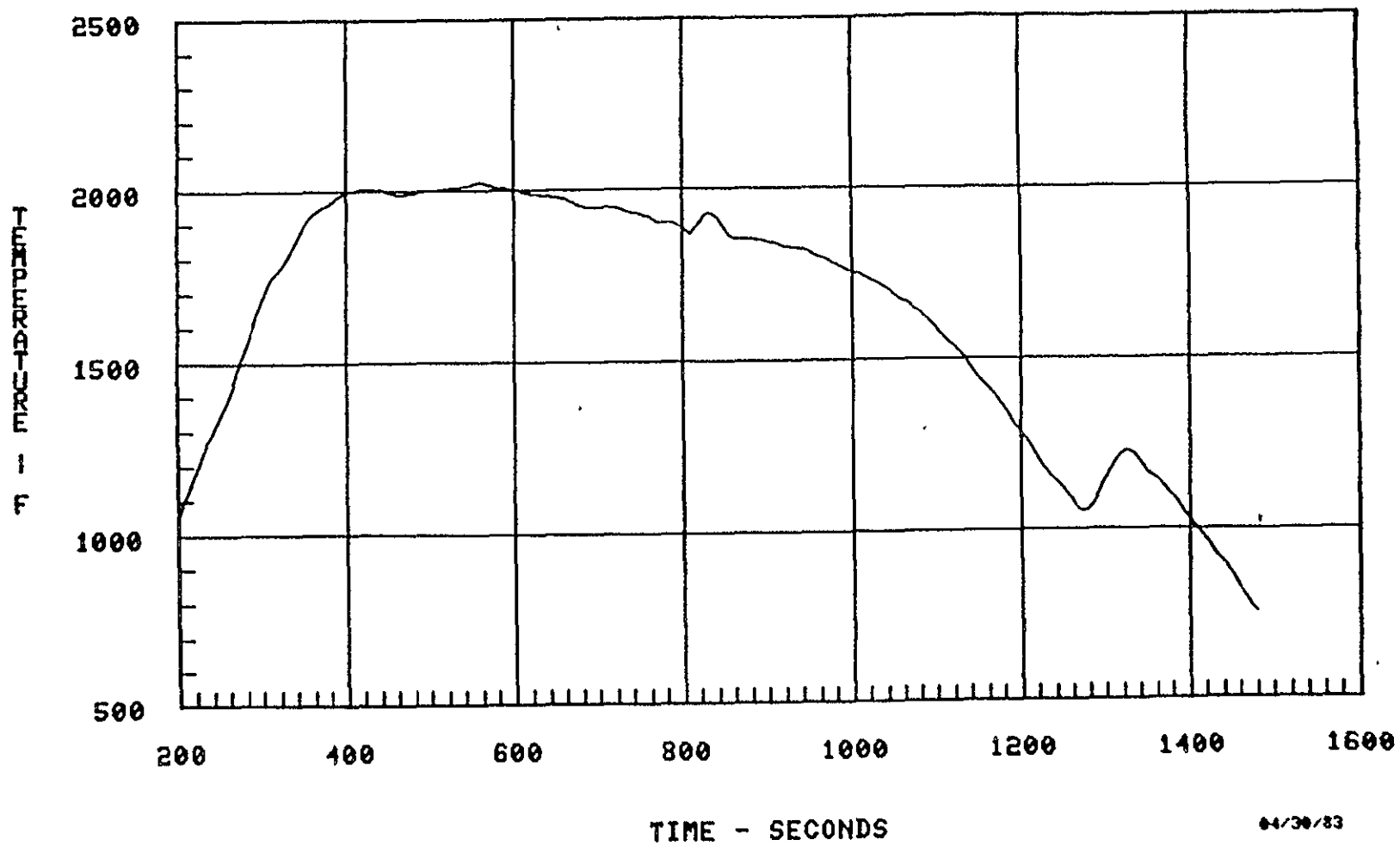
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# STS-2 (107 FT LENGTH CL X/L=0.16) FLIGHT PARAMETER COMPARISO

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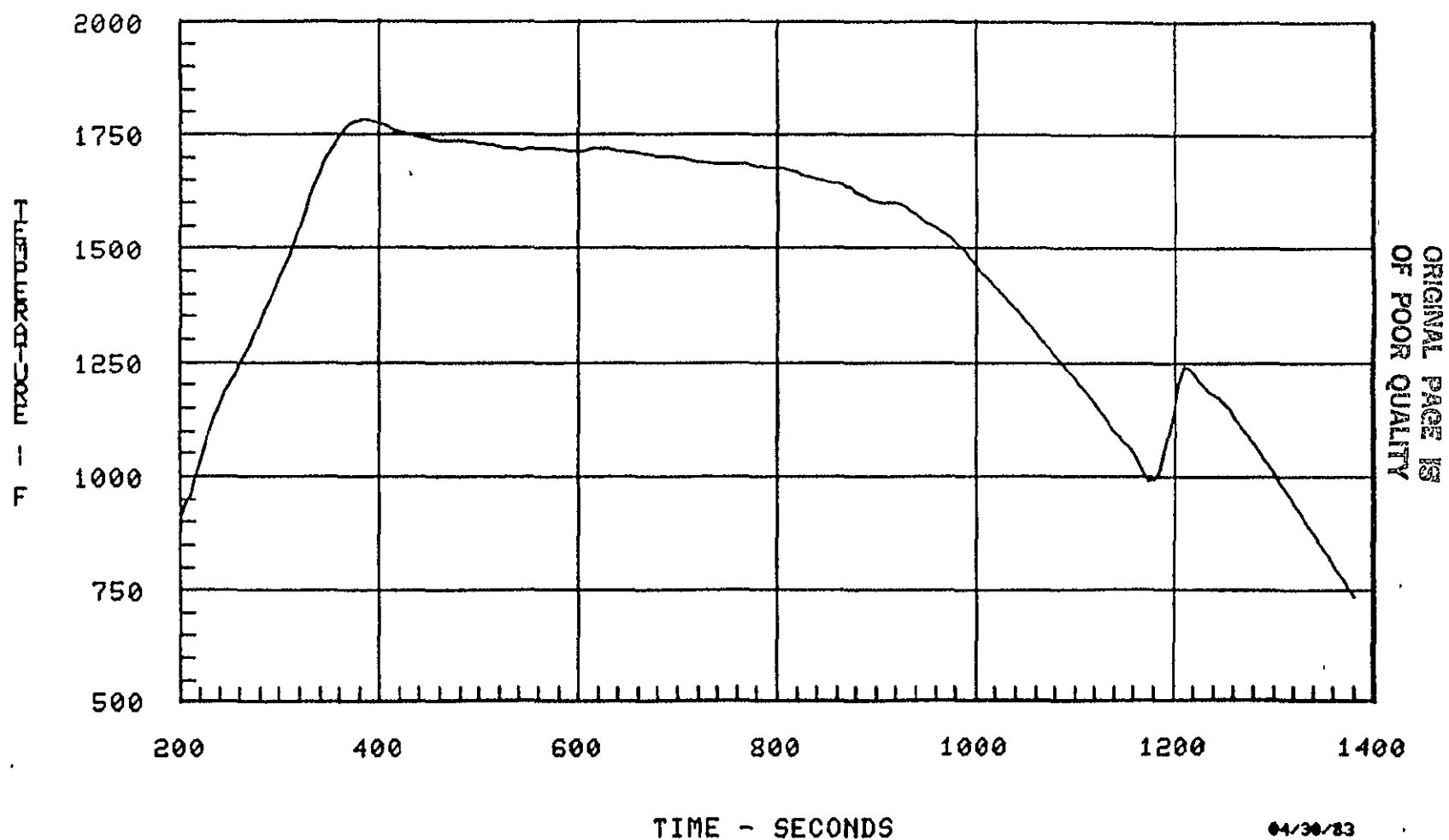


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04/30/83

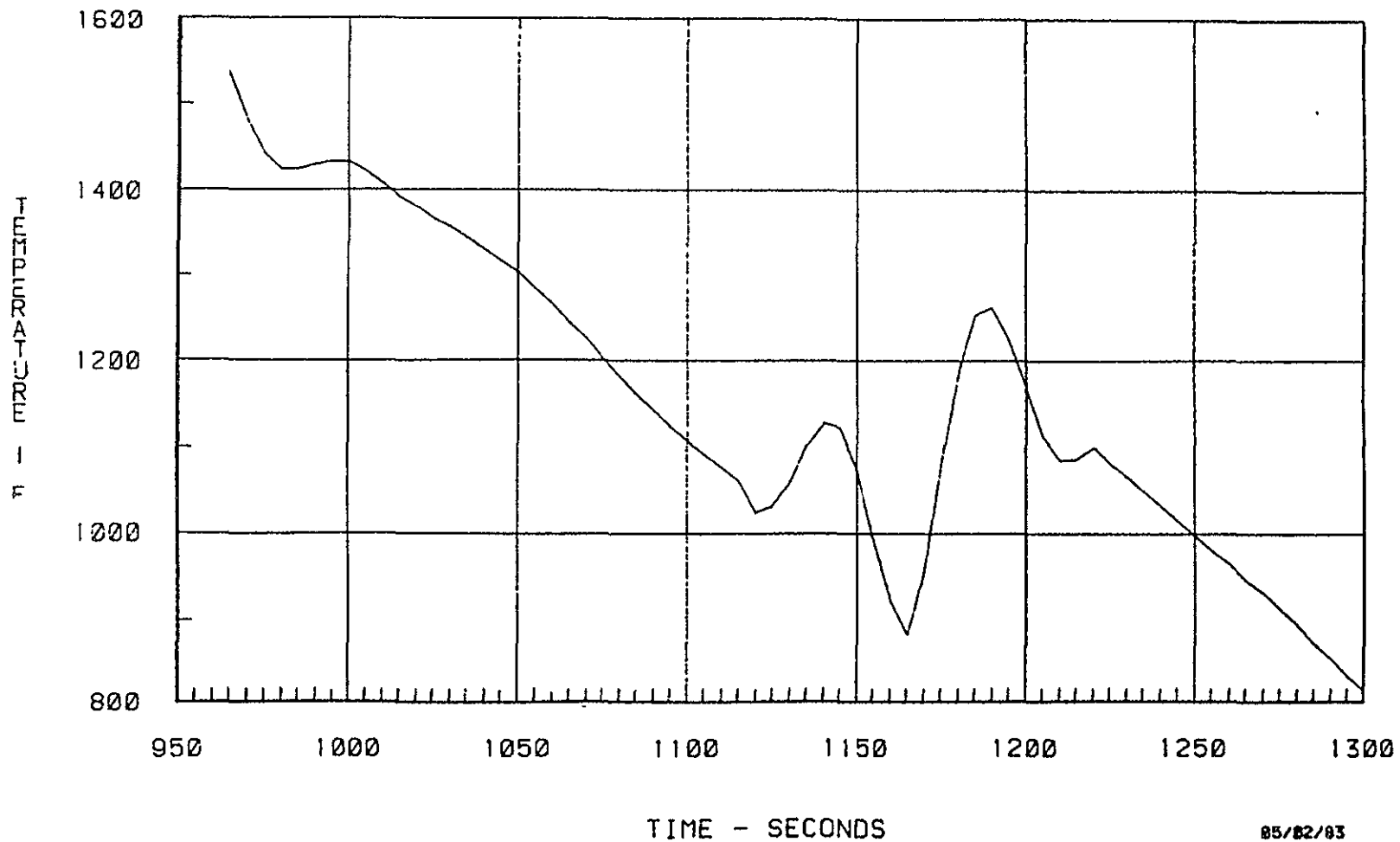
STS-3 (107 FT LENGTH CL  $X/L=0.16$ ) FLIGHT PARAMETER COMPARISO

U07T9463A



STS-4 (107 FT LENGTH CL  $X/L=0.16$ ) FLIGHT PARAMETER COMPARISO

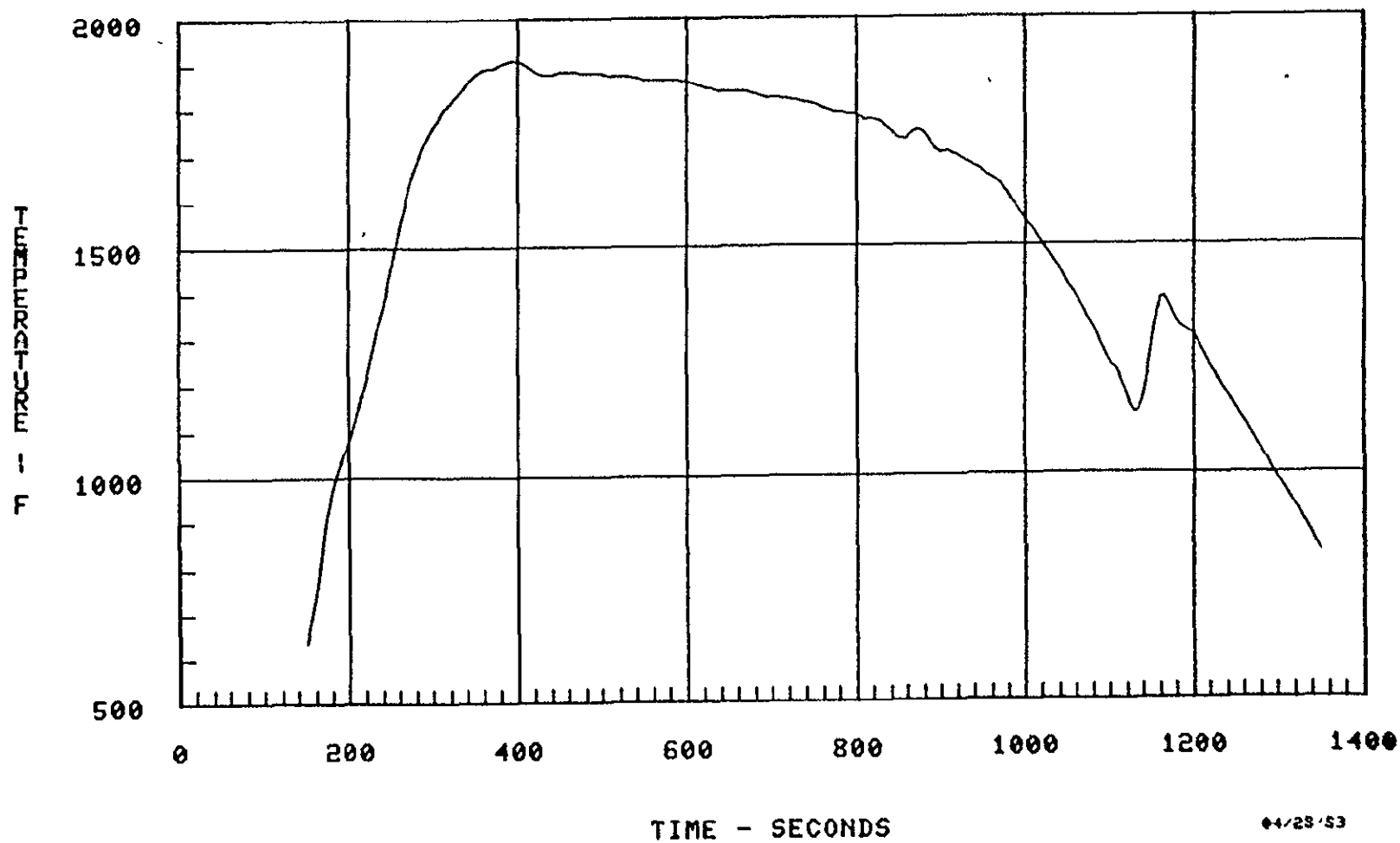
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U87T9463A



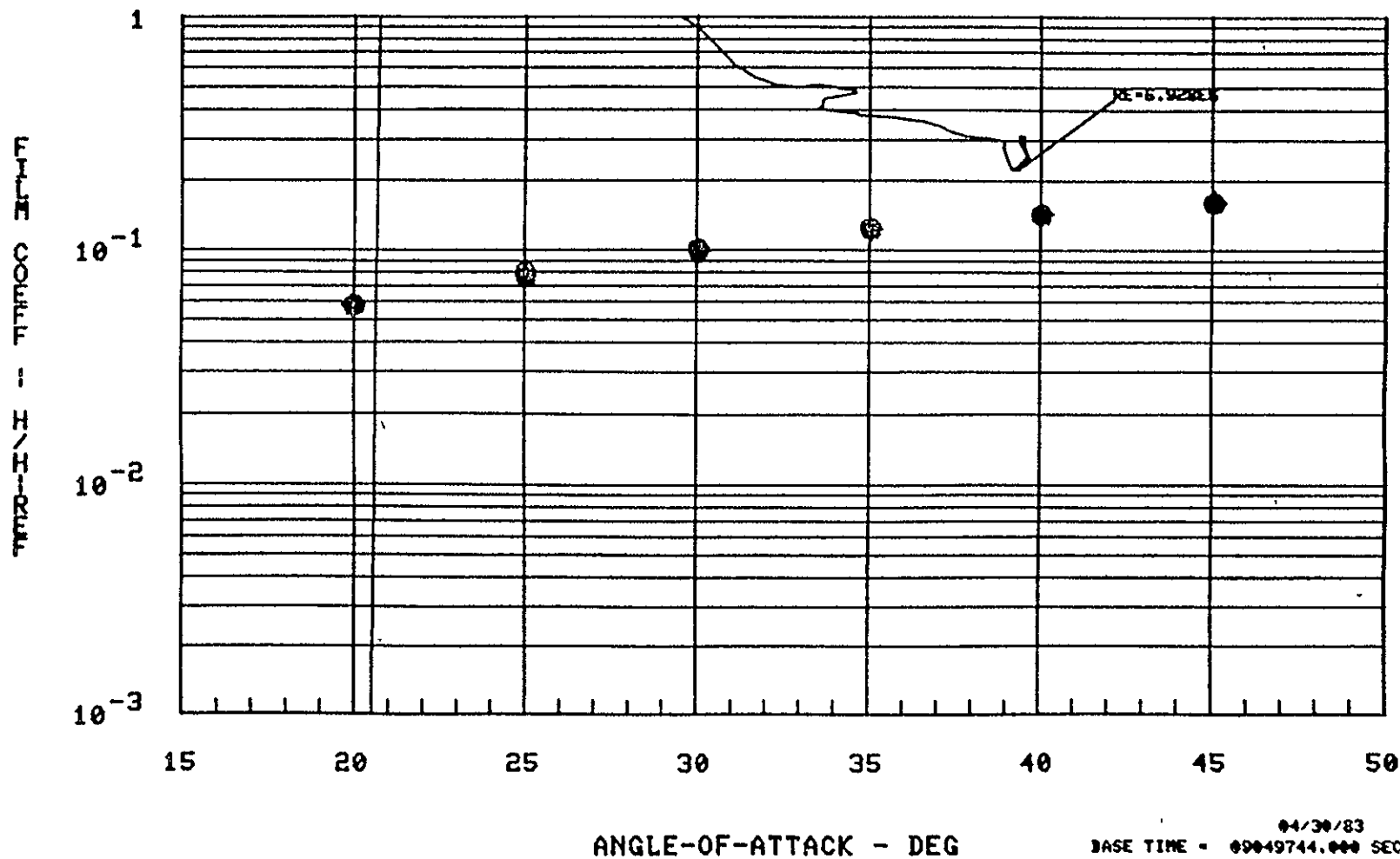
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# STS-1 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISS

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9464A/H-REF 1065-1460 SEC





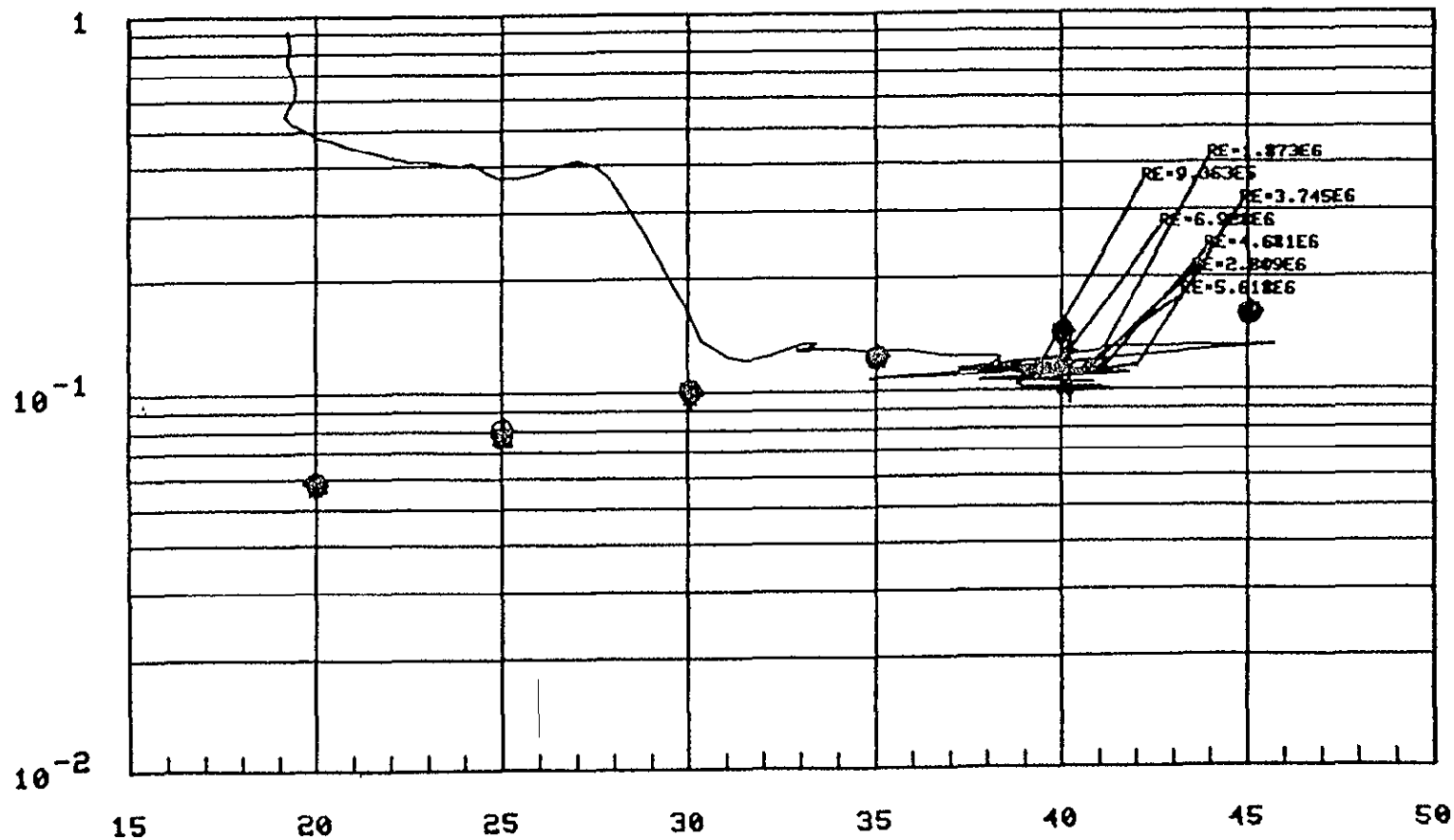
# STS-2 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9464A/H-REF 200-1480 SEC

WING COEFF - H/I-CL



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ANGLE-OF-ATTACK - DEG

04/30/83  
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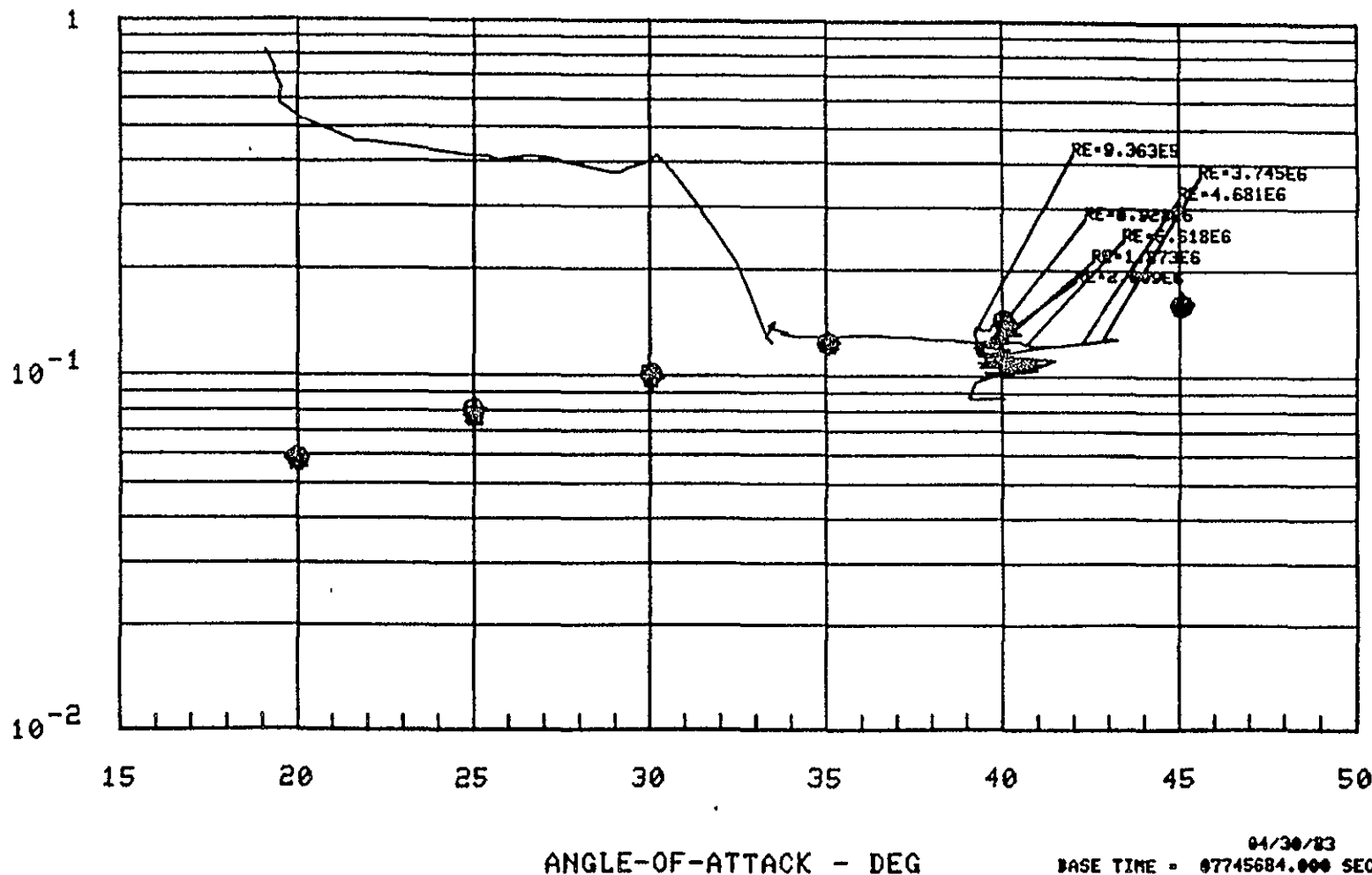
# STS-3 (107 FT LENGTH CL $X/L=0.20$ ) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9464A/H-REF 200-1380 SEC

LINE COUNT - I/I-2000



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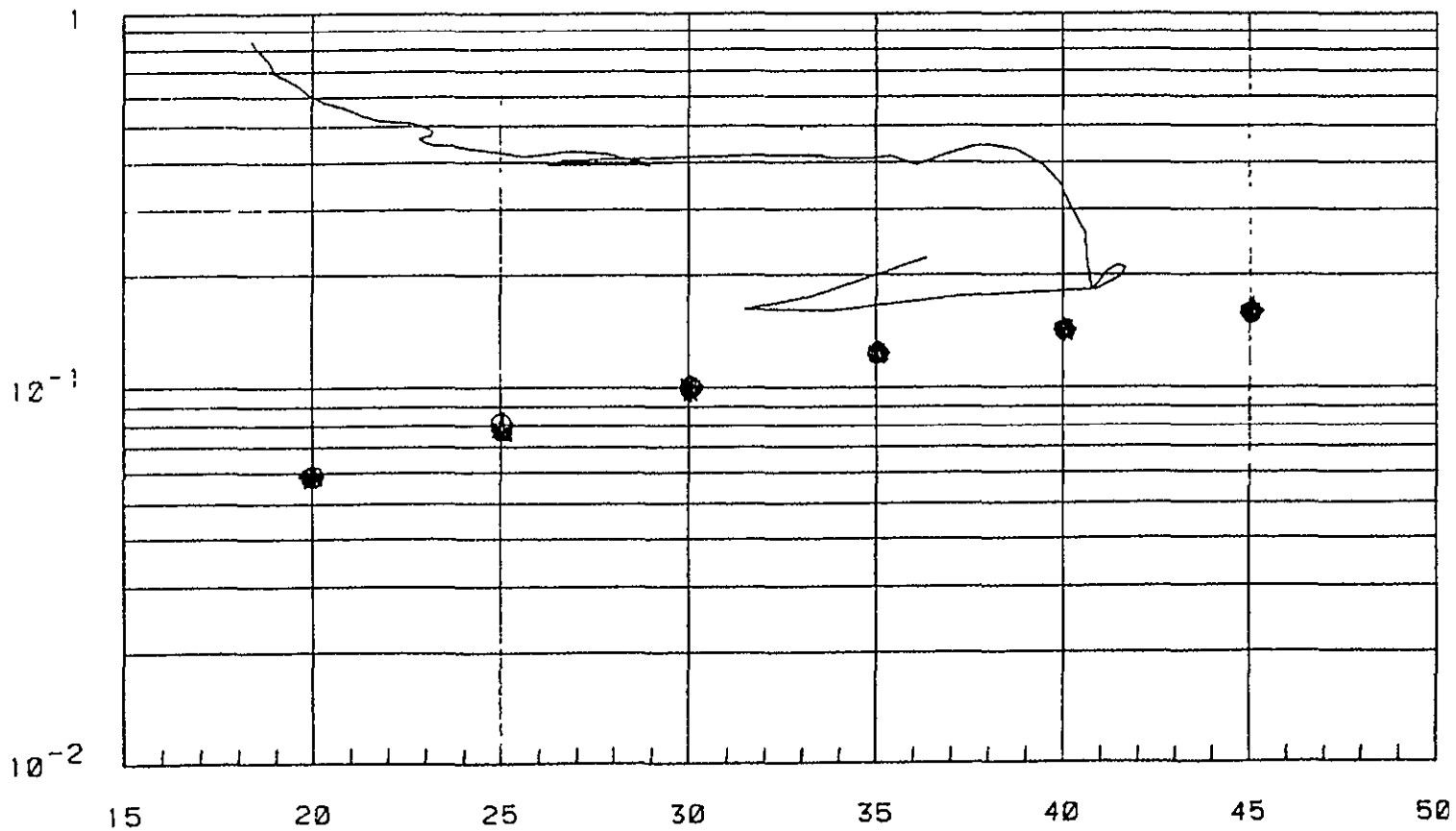
# STS-4 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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OH49 0 0175 SCALE RE = 0.5 E06  
 OH49 0 0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0 0175 SCALE RE = 3.0 E06  
 OH49 0 0175 SCALE RE = 3.7 E06

V07T0464A/H-REF 065-1300 SEC

FILE COMPARISON H/I-REF



ANGLE-OF-ATTACK - DEG

05/02/83  
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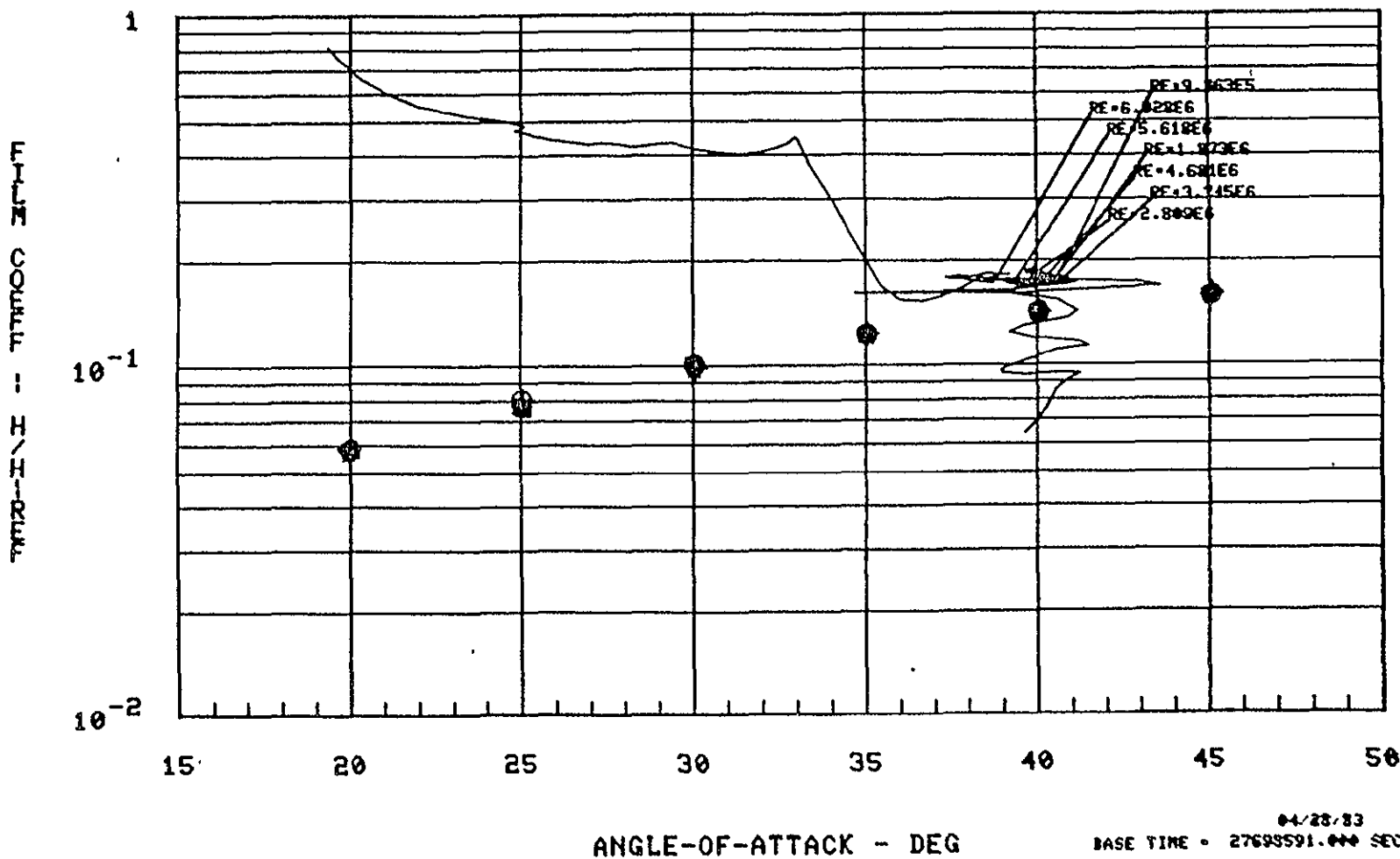
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# STS-5 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

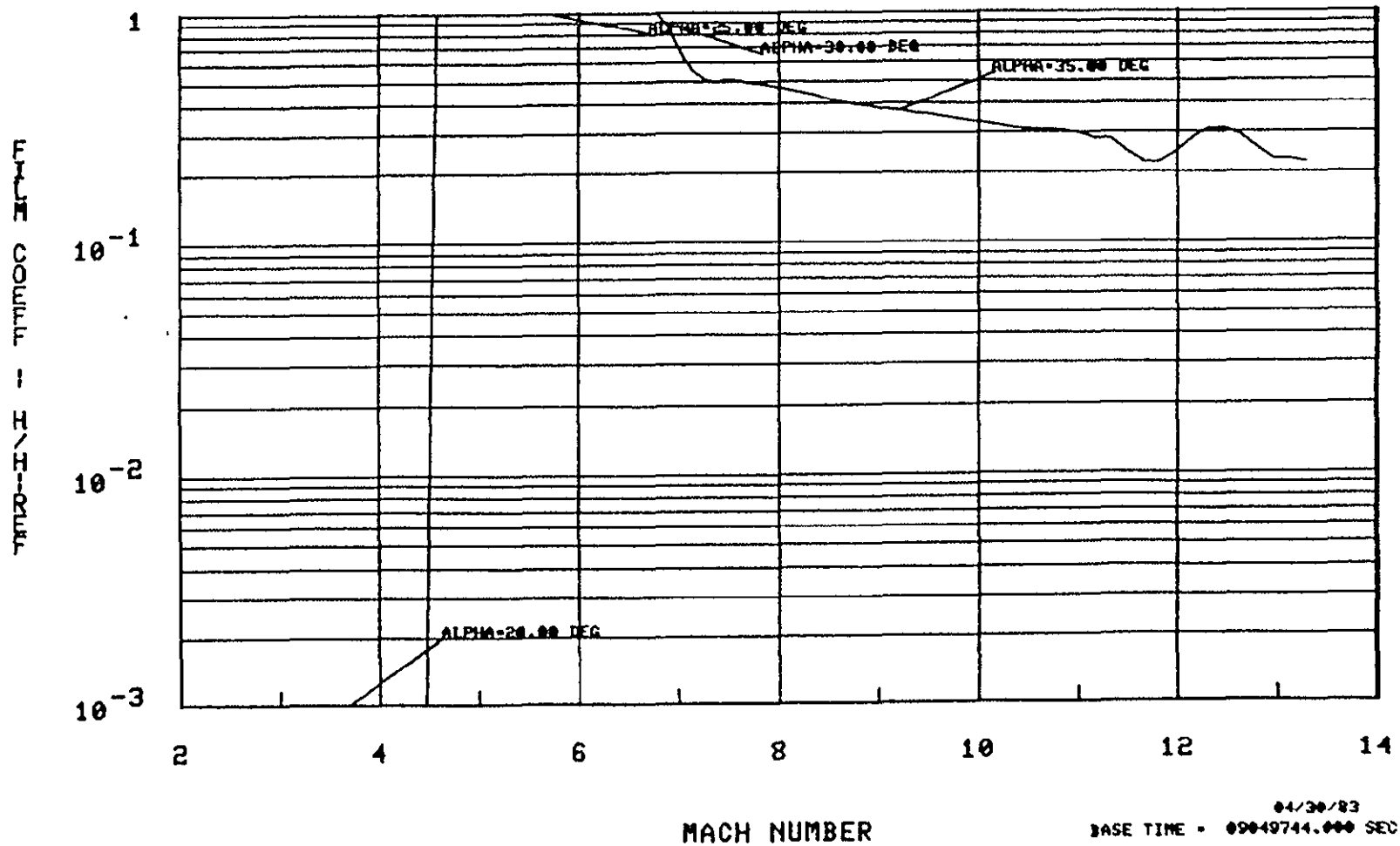
U07T9464A/H-REF 150-1350 SEC



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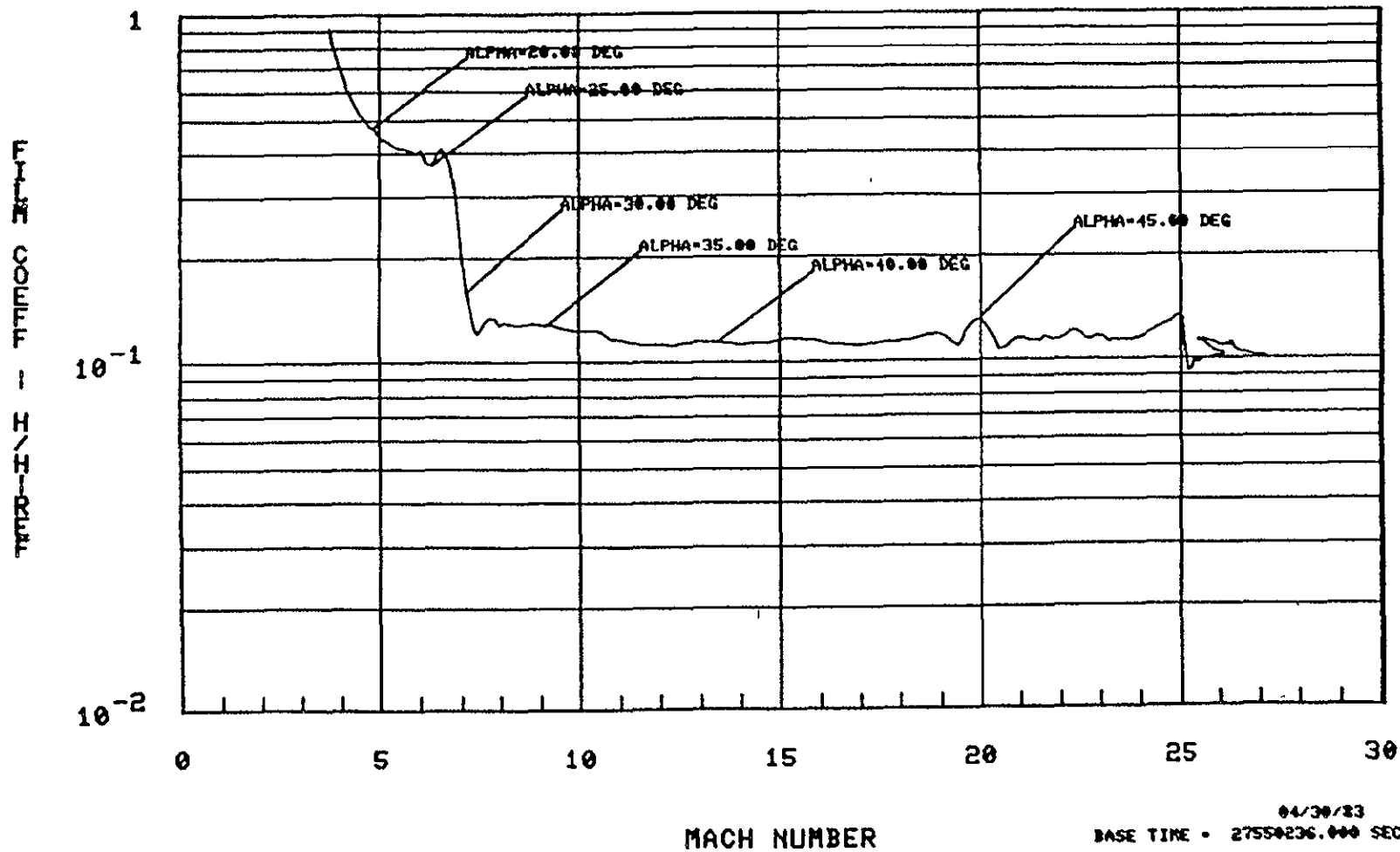
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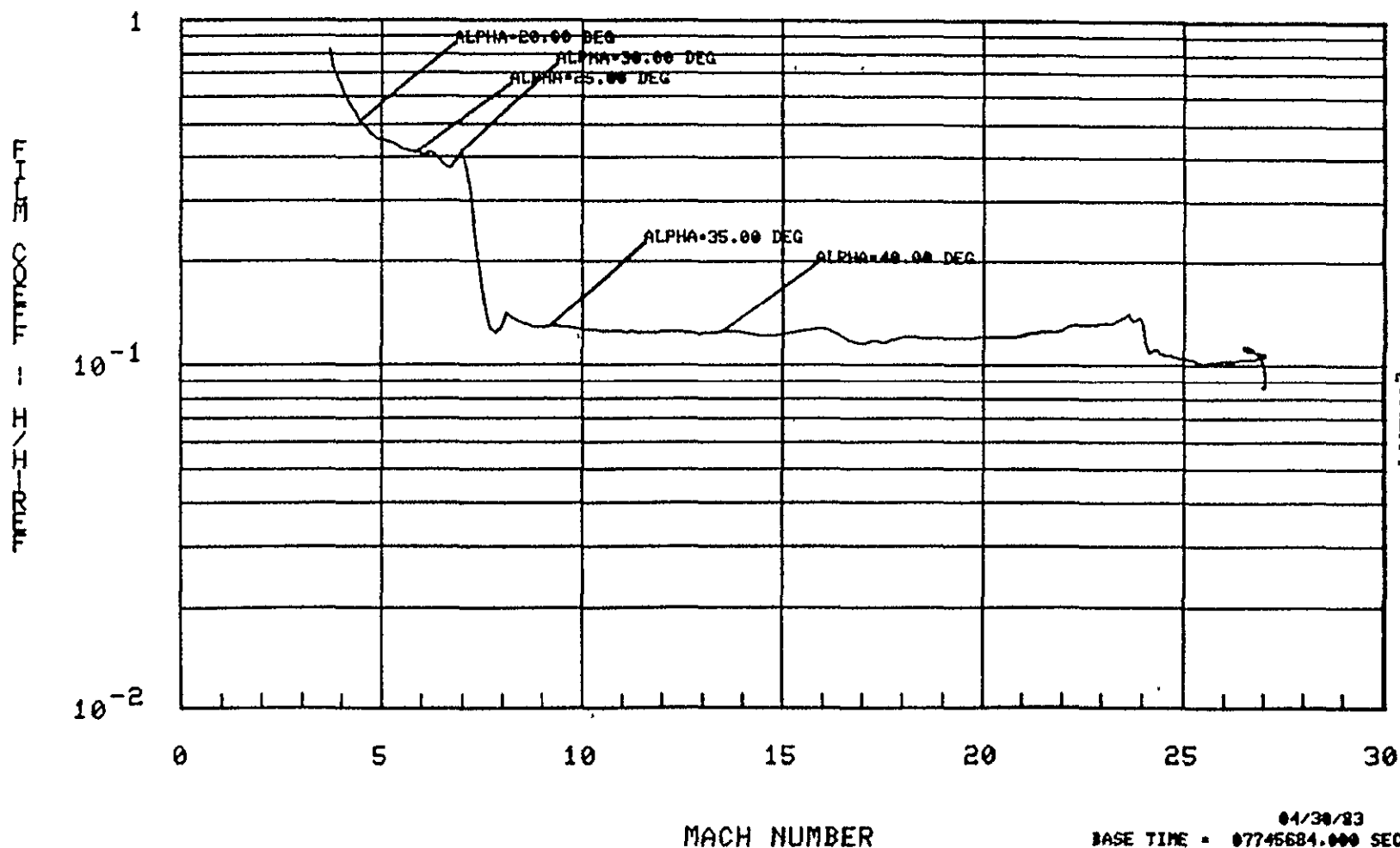
U07T9464A/H-REF 200-1480 SEC



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# STS-3 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

U07T9464A/H-REF 200-1380 SEC



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B-103

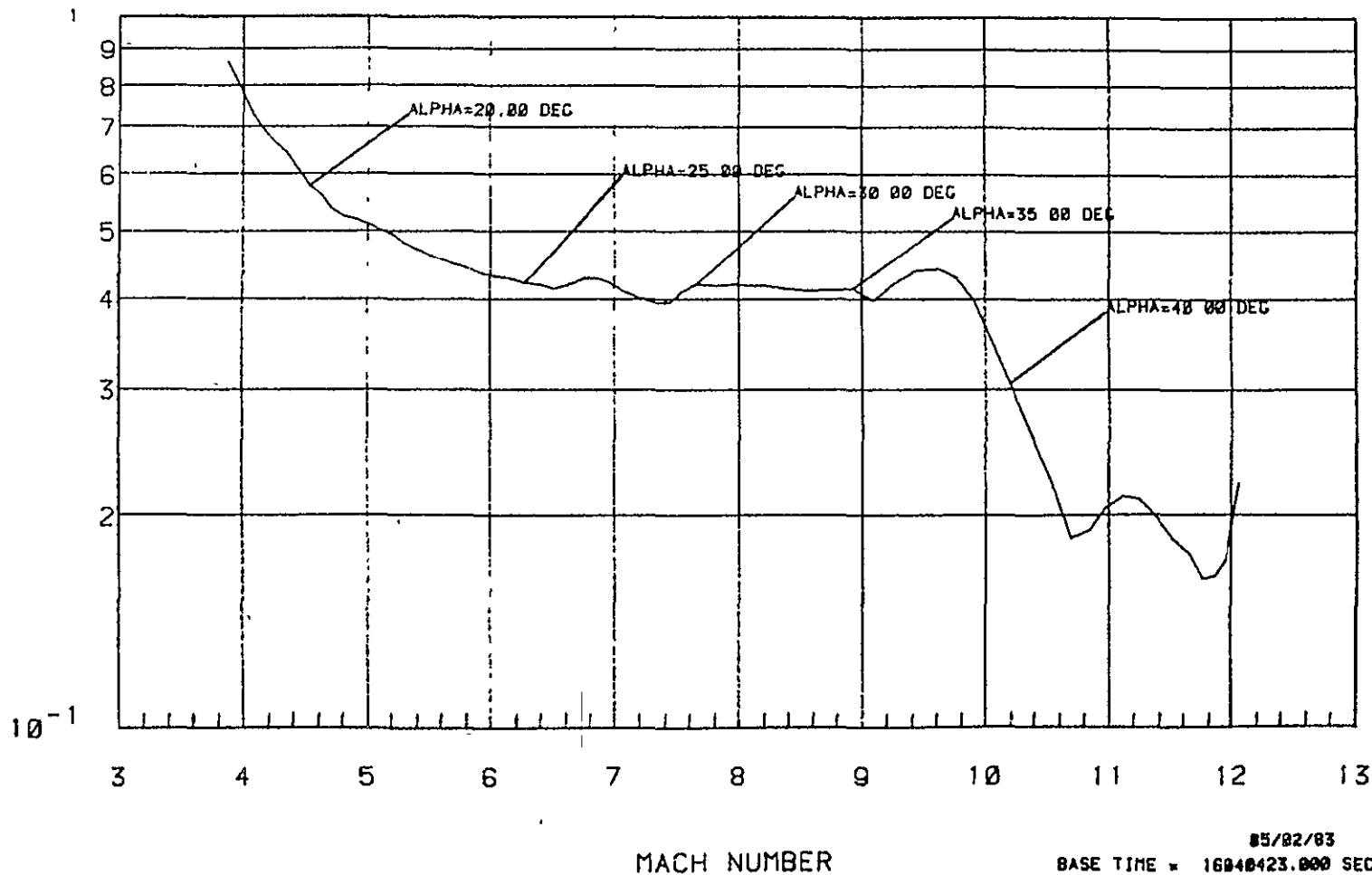
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V07T9464A/H-REF 065-1300 SEC

FLIGHT COORDINATE - H-REF

B-104

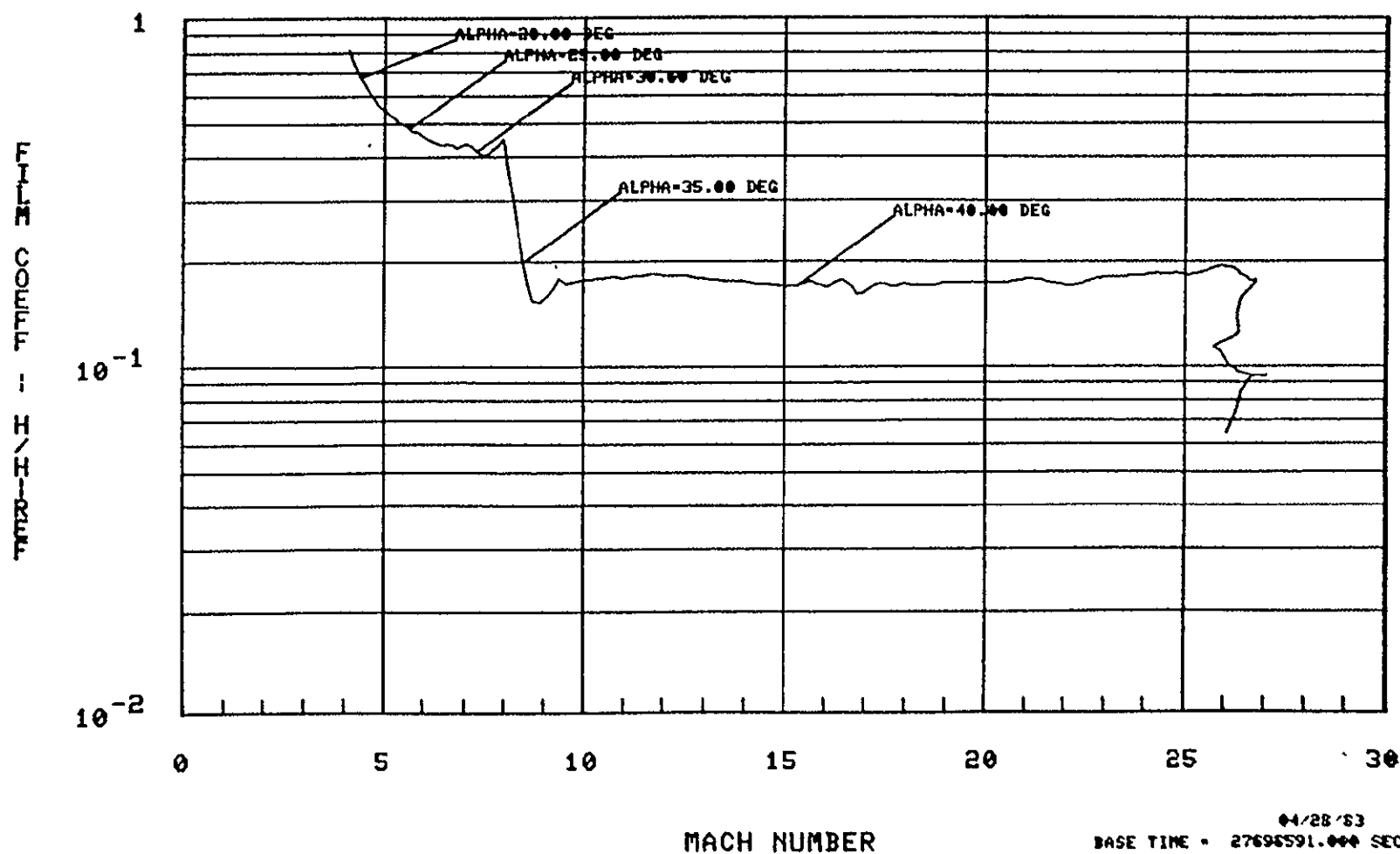


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# STS-5 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

U07T9464A/H-REF 150-1350 SEC



B-105

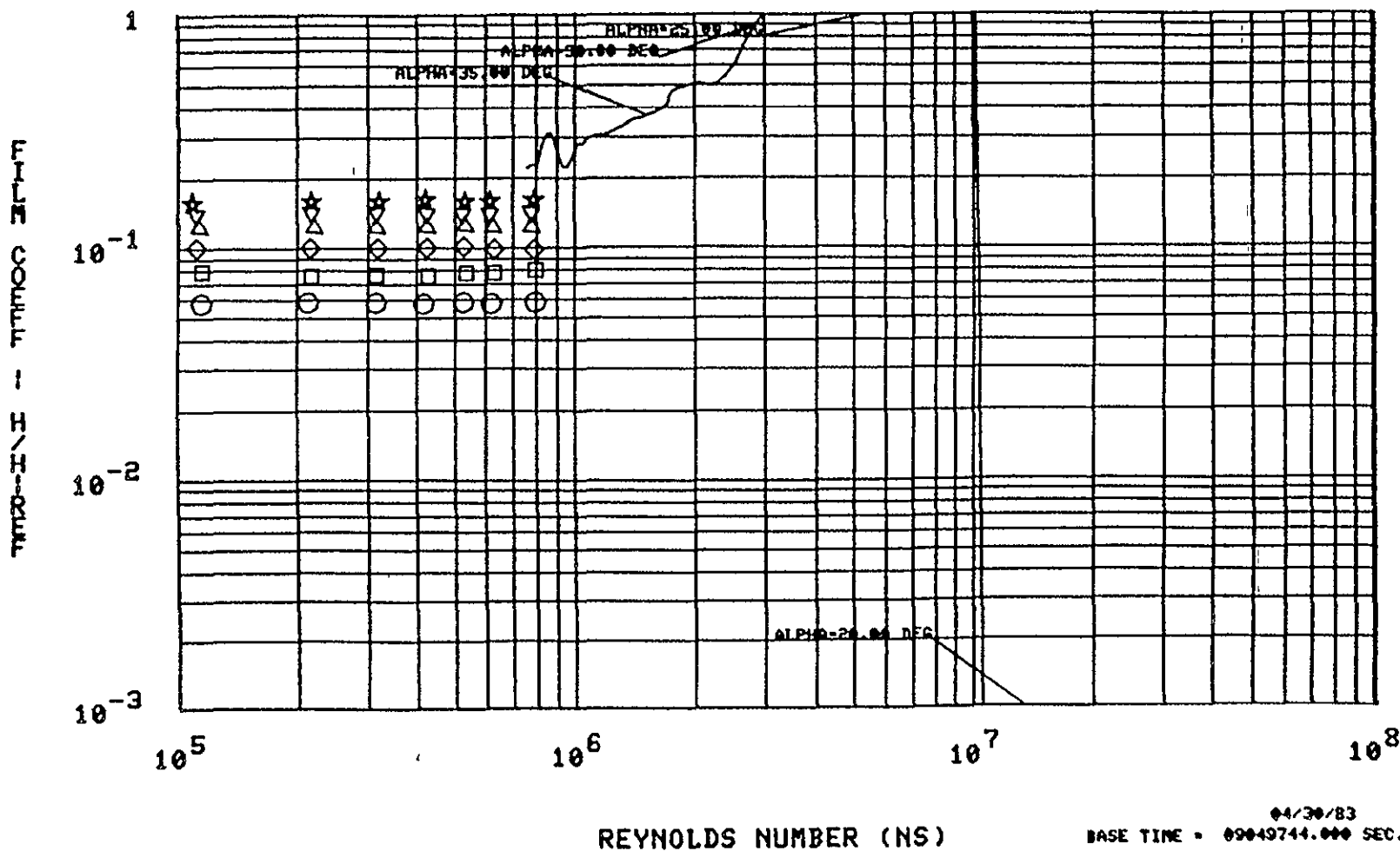
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# STS-1 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9464A/H-REF 1065-1460 SEC



B-106

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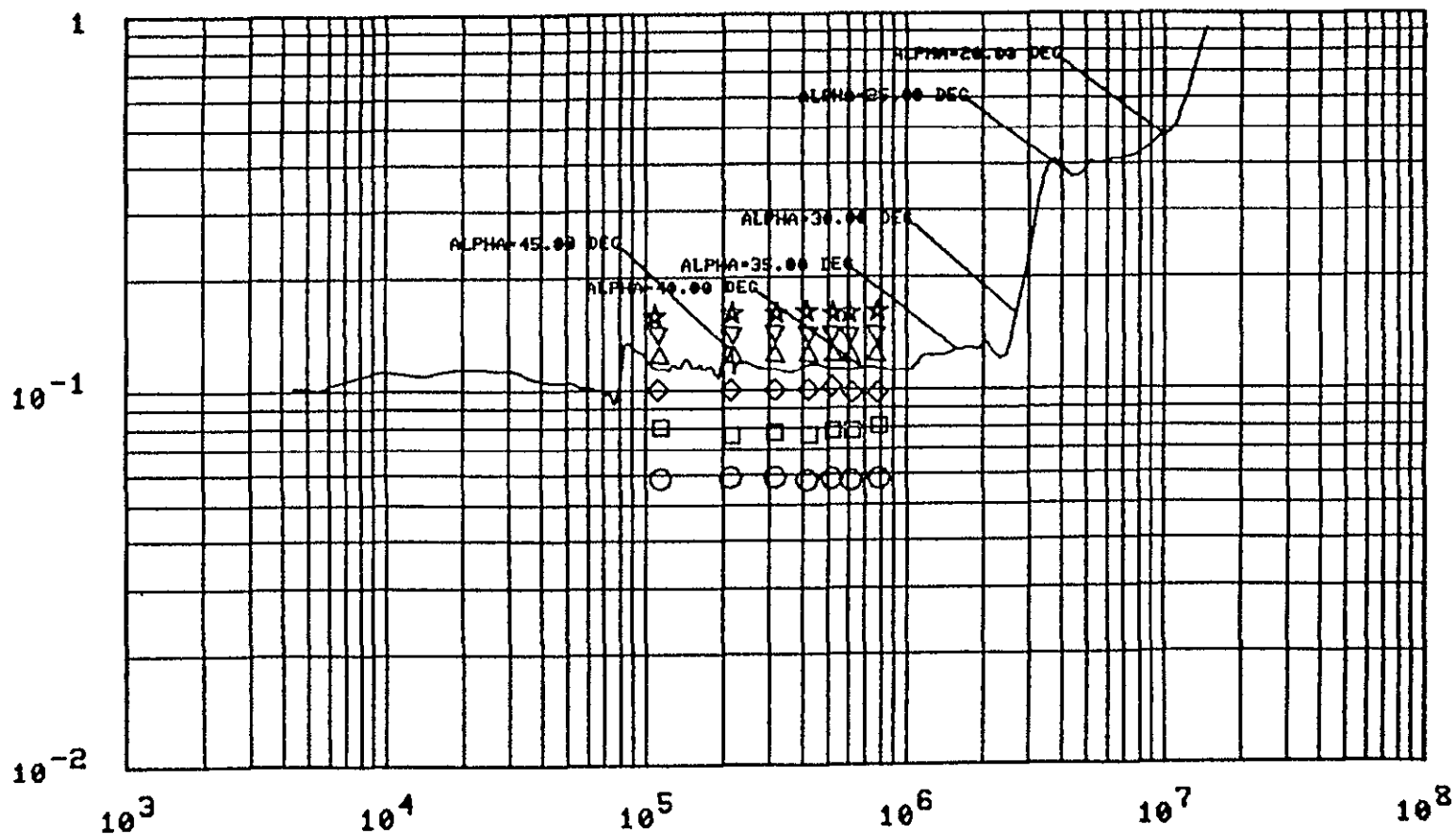
# STS-2 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9464A/H-REF 200-1480 SEC

LINE COUNT - 111-0244



REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME = 27550236.000 SEC.

B-107

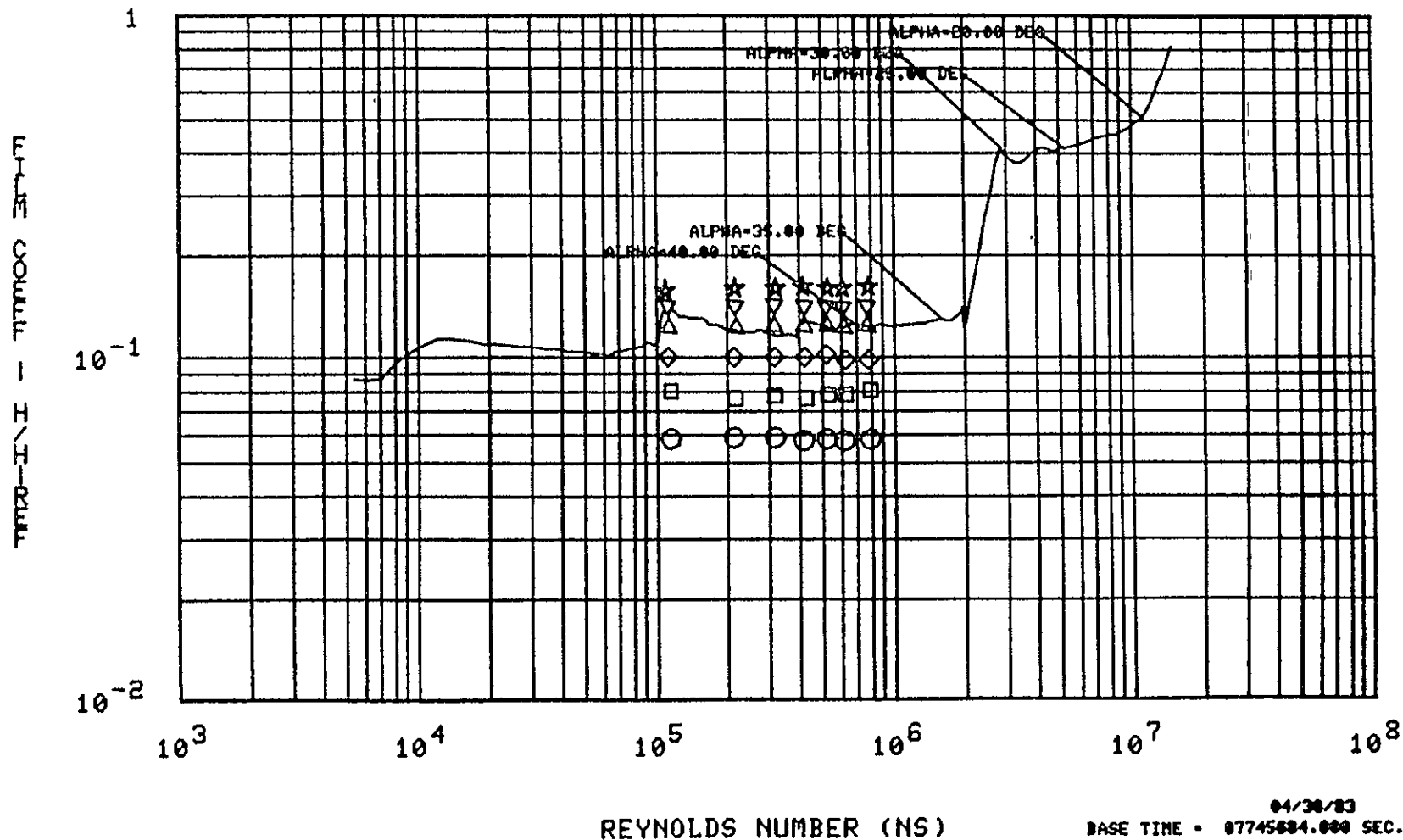
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# ST5-3 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9464A/H-REF 200-1380 SEC



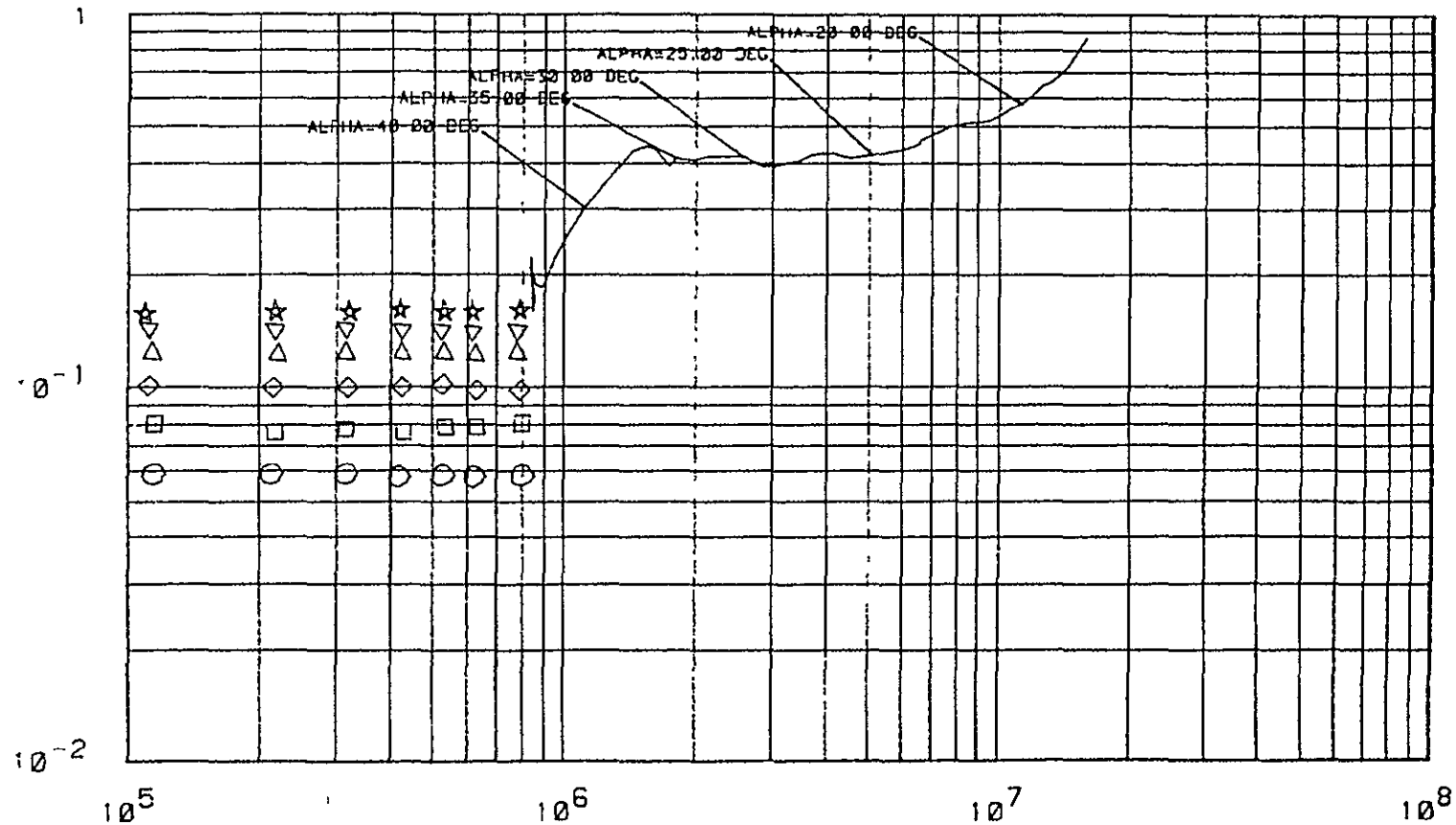
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# STS-4 (107 FT LENGTH CL $X/L=0.20$ ) FLIGHT PARAMETER COMPARISON

$\circ$  OH49 ALPHA = 20 DEGREES  
 $\square$  OH49 ALPHA = 25 DEGREES  
 $\diamond$  OH49 ALPHA = 30 DEGREES  
 $\triangle$  OH49 ALPHA = 35 DEGREES  
 $\nabla$  OH49 ALPHA = 40 DEGREES  
 $\star$  OH49 ALPHA = 45 DEGREES

—— V07T0464A/H-REF 965-1300 SEC

WAVE COEFF - I/I-REF



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REYNOLDS NUMBER (NS)

05/02/83  
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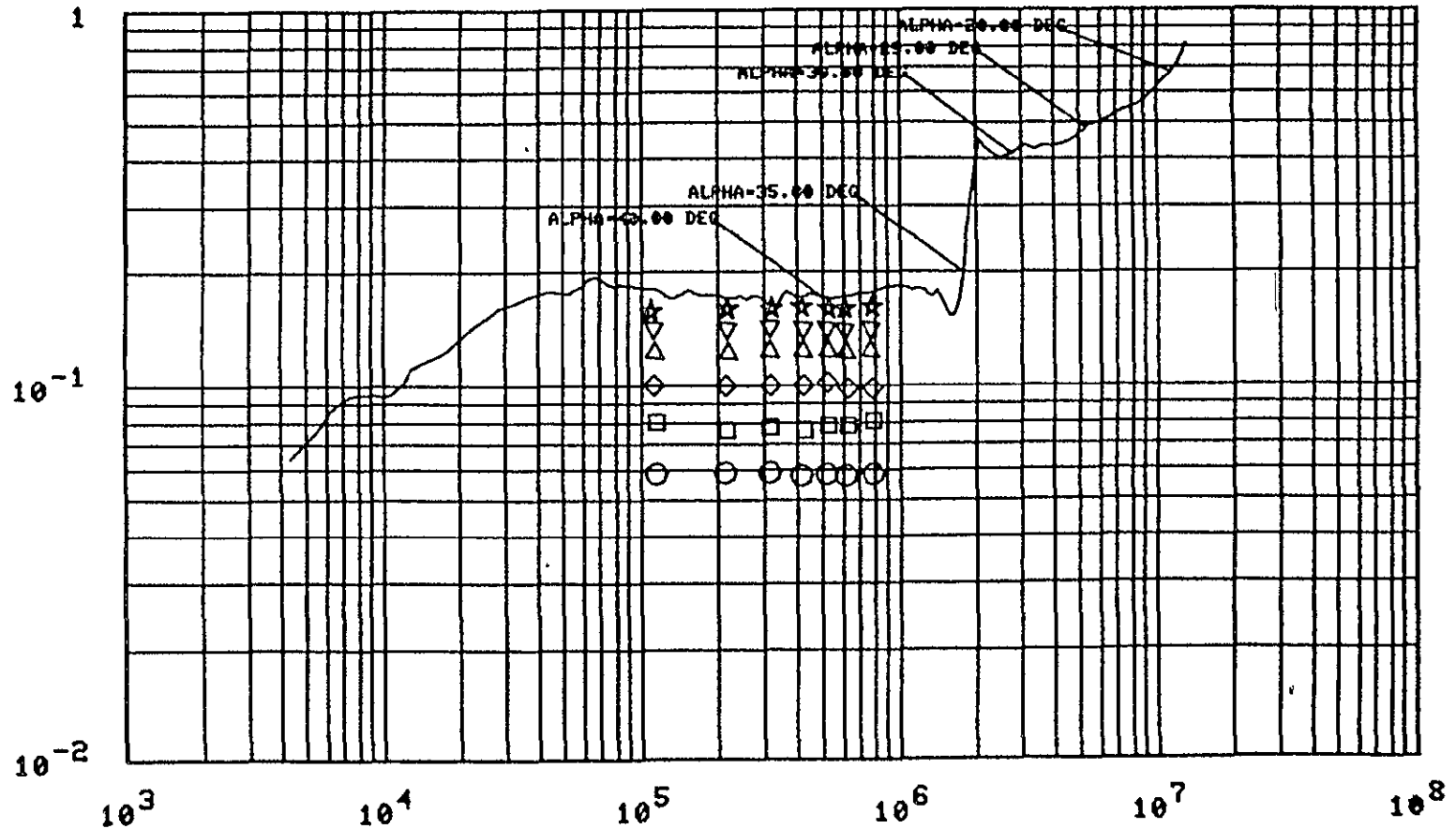
# STS-5 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9464A/H-REF 150-1350 SEC

WING COEFFICIENT - H/I-CRUI



REYNOLDS NUMBER (NS)

04/28/83  
BASE TIME = 27598591.000 SEC.

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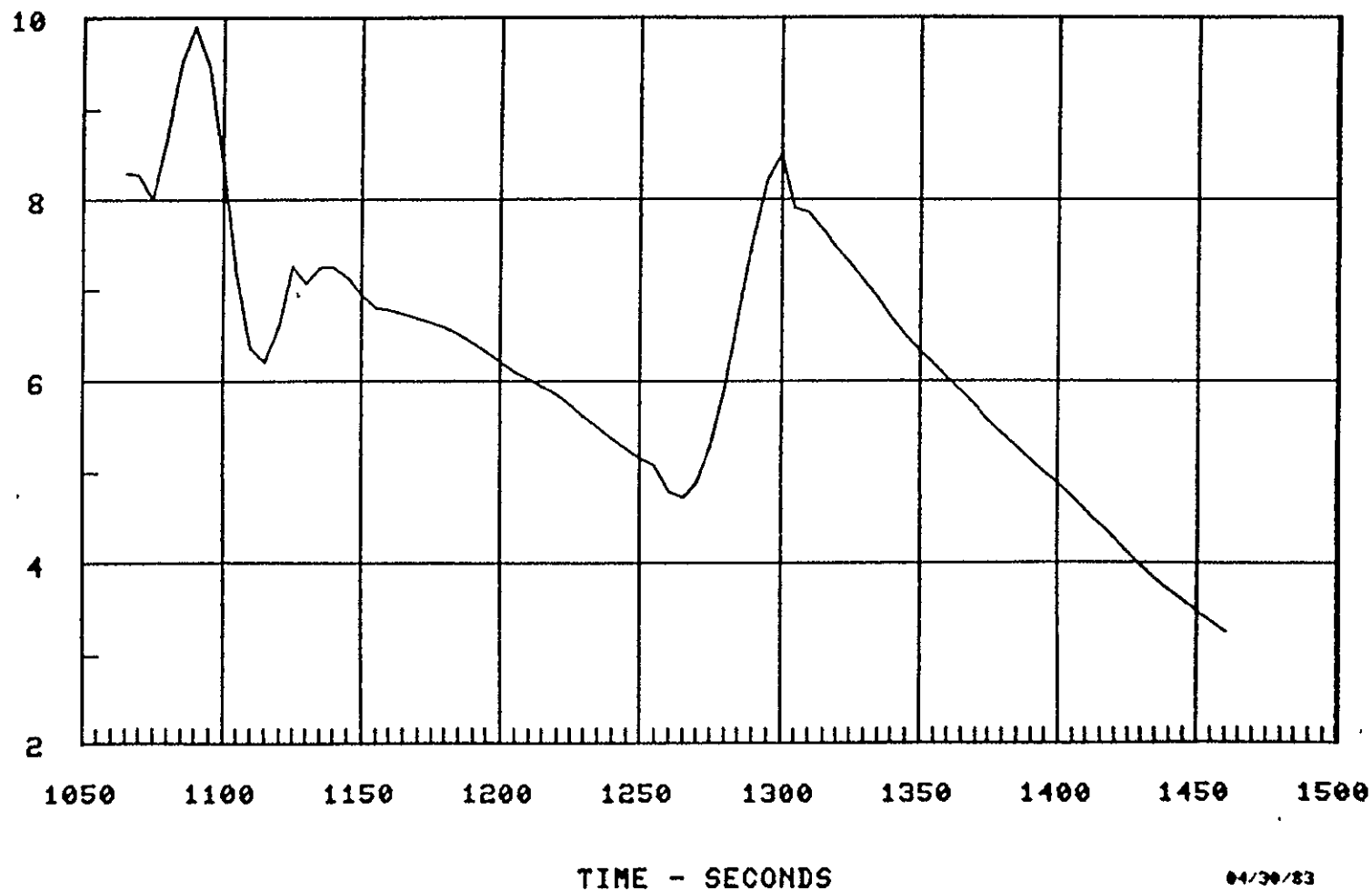
B-110

C-3

# STS-1 (107 FT LENGTH CL $X/L=0.20$ ) FLIGHT PARAMETER COMPARISO

U87T9464A

INDICATED RATE -- ACCELERATION -- GMS



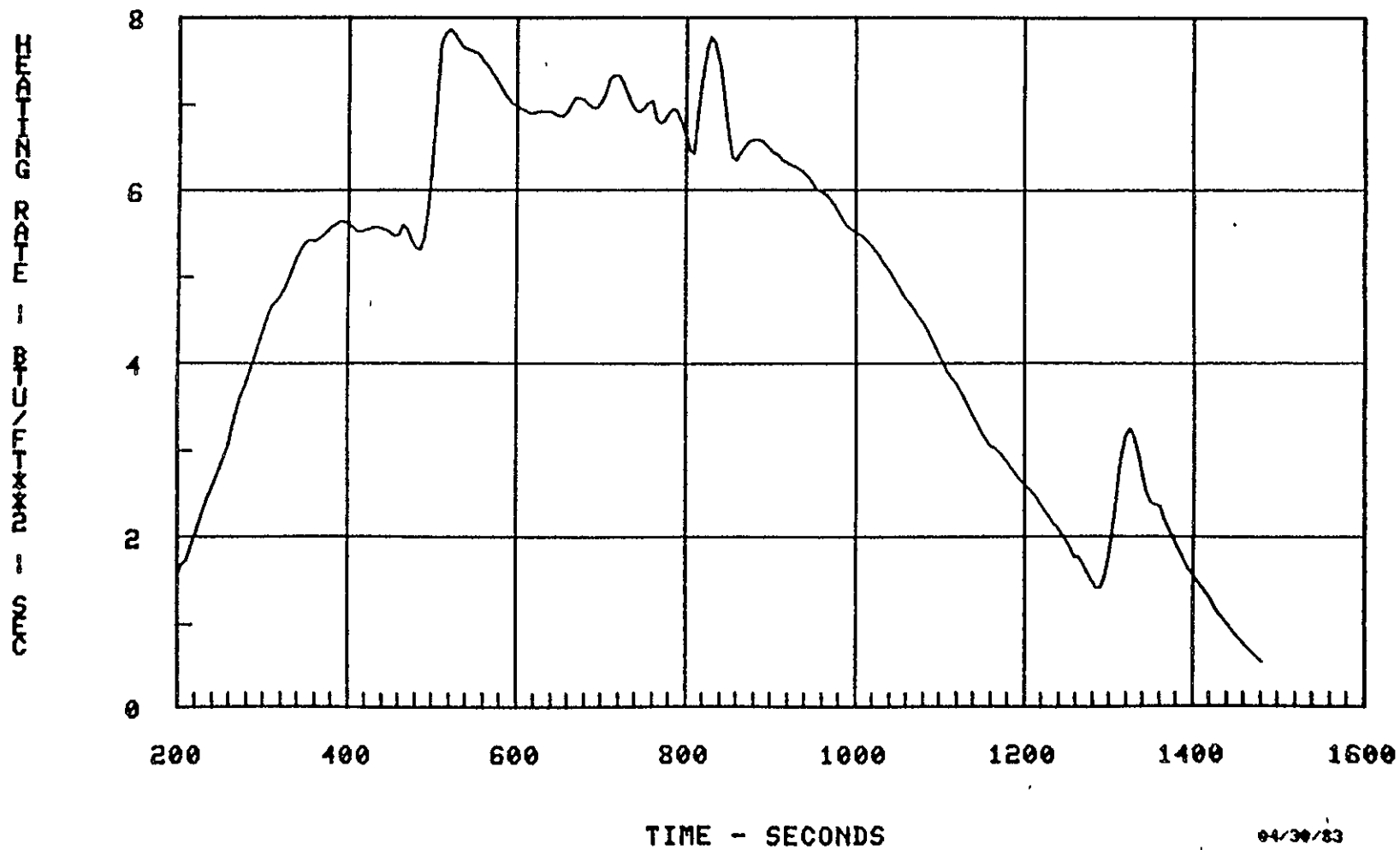
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04/30/83

B-111

## STS-2 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

U07T9464A



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B-112

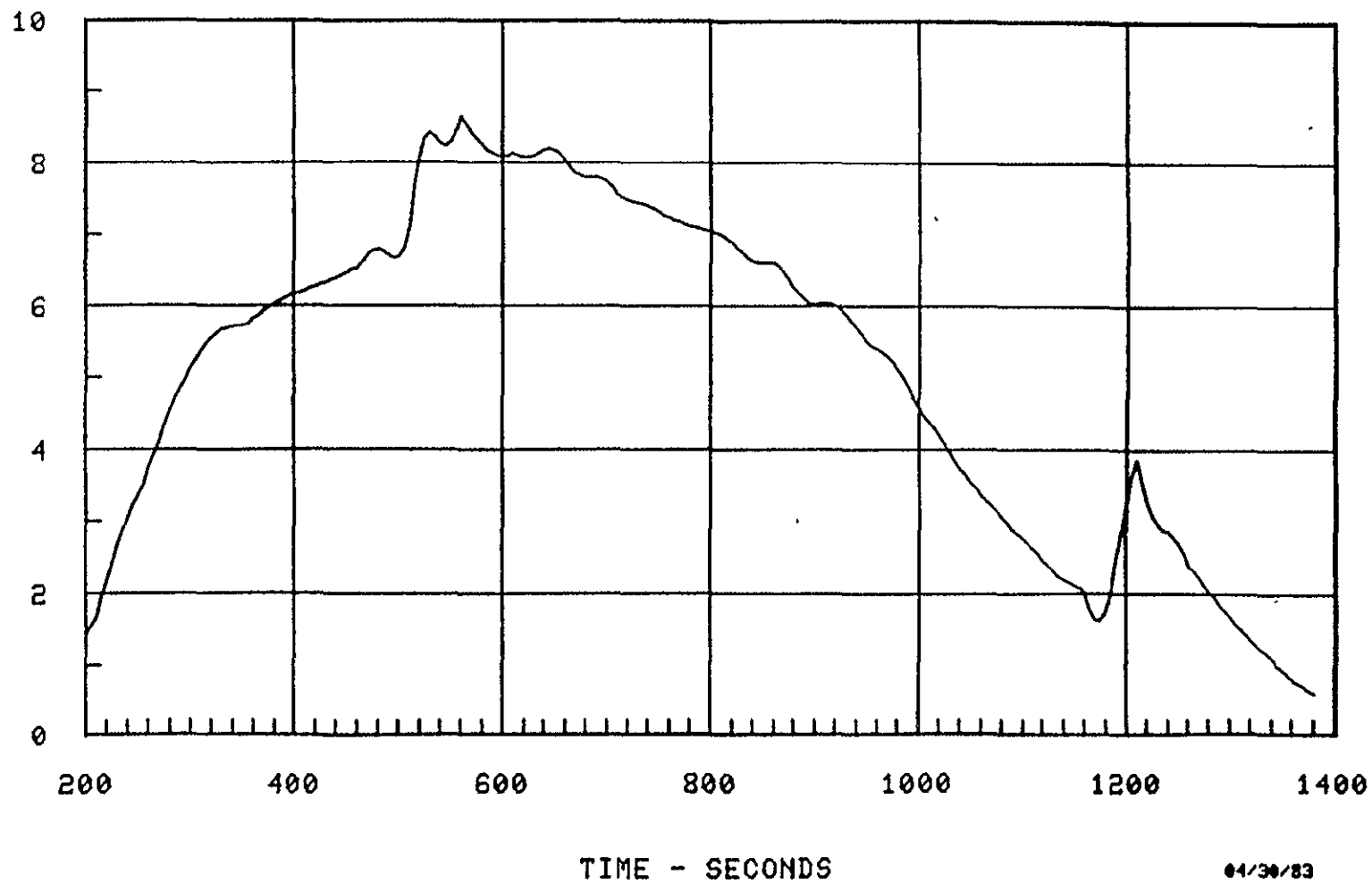


# STS-3 (107 FT LENGTH CL $X/L=0.20$ ) FLIGHT PARAMETER COMPARISO

U07T9464A

INTEGRATED WITH - 8-7-81-XXU - 0000

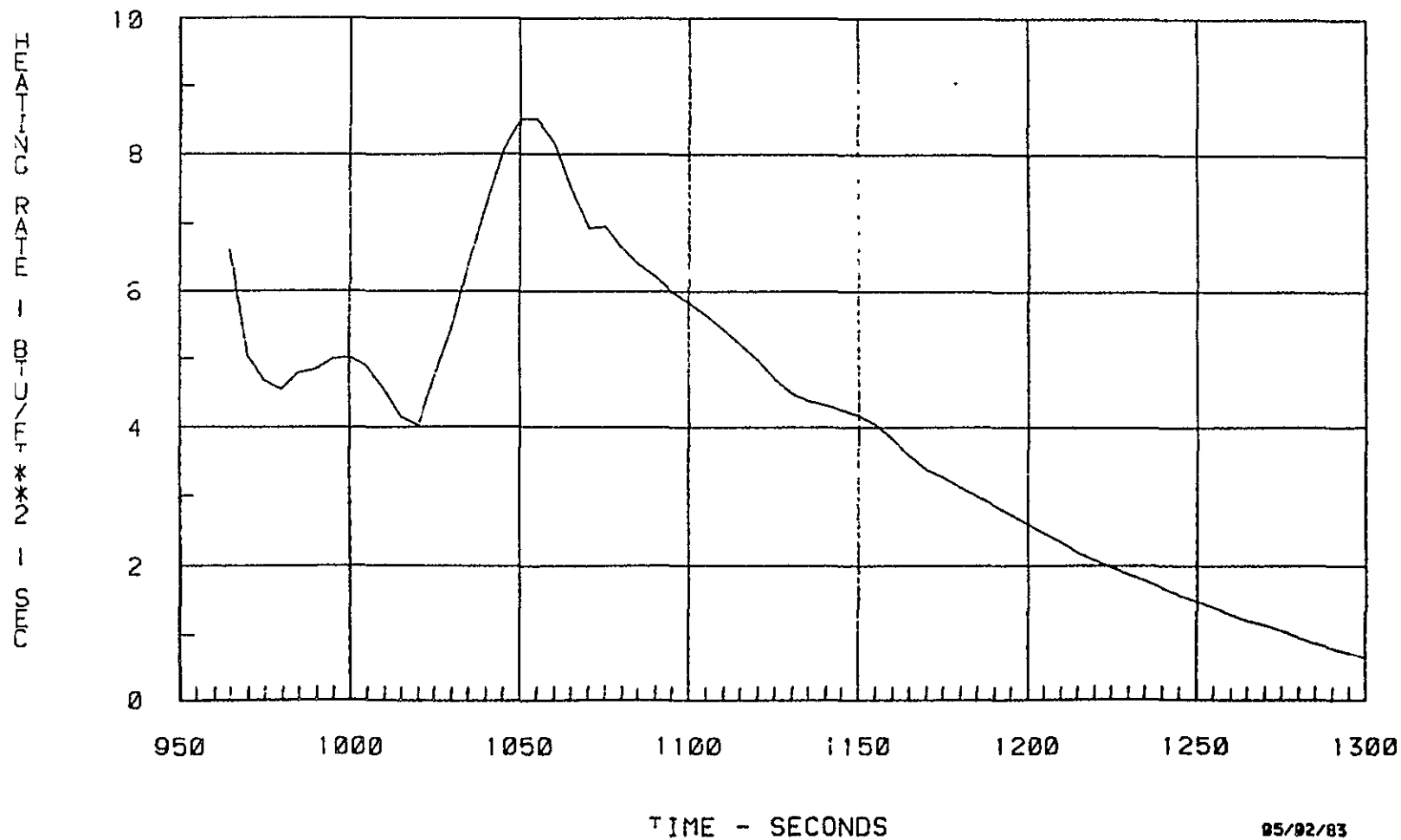
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04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

V07T0464A



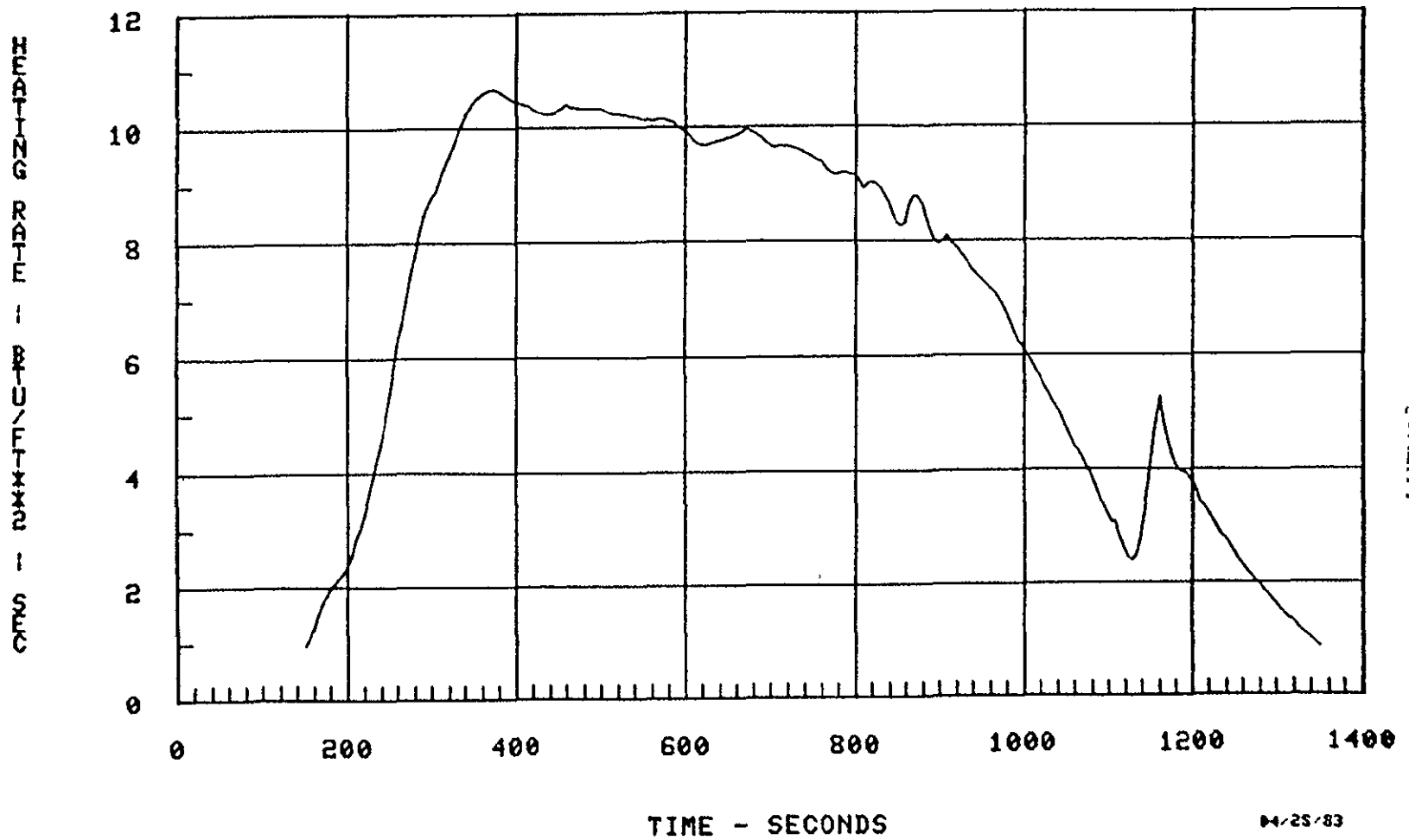
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B-114

05/92/83

## STS-5 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISON

U07T9464A



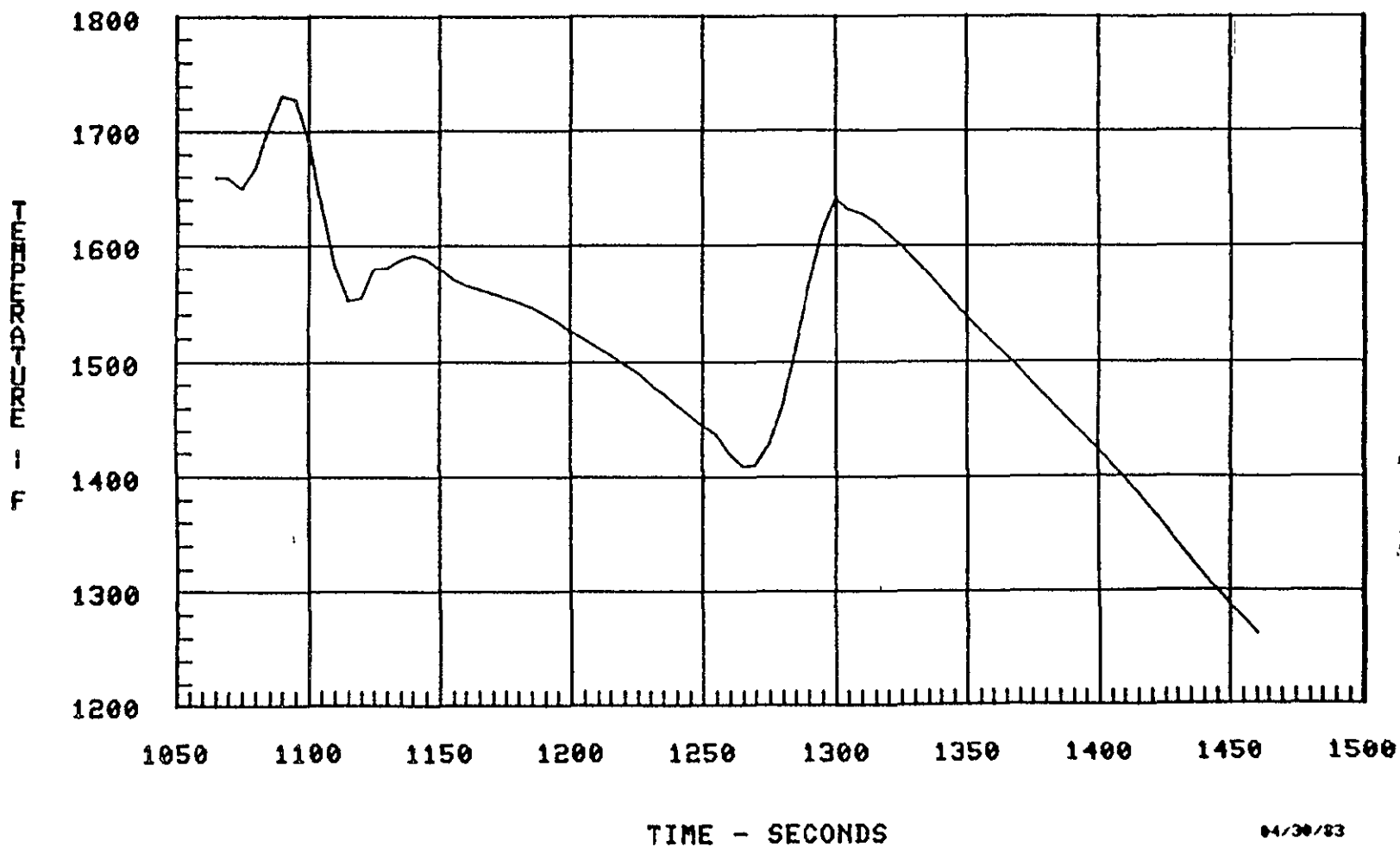
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B-715

04/25/83

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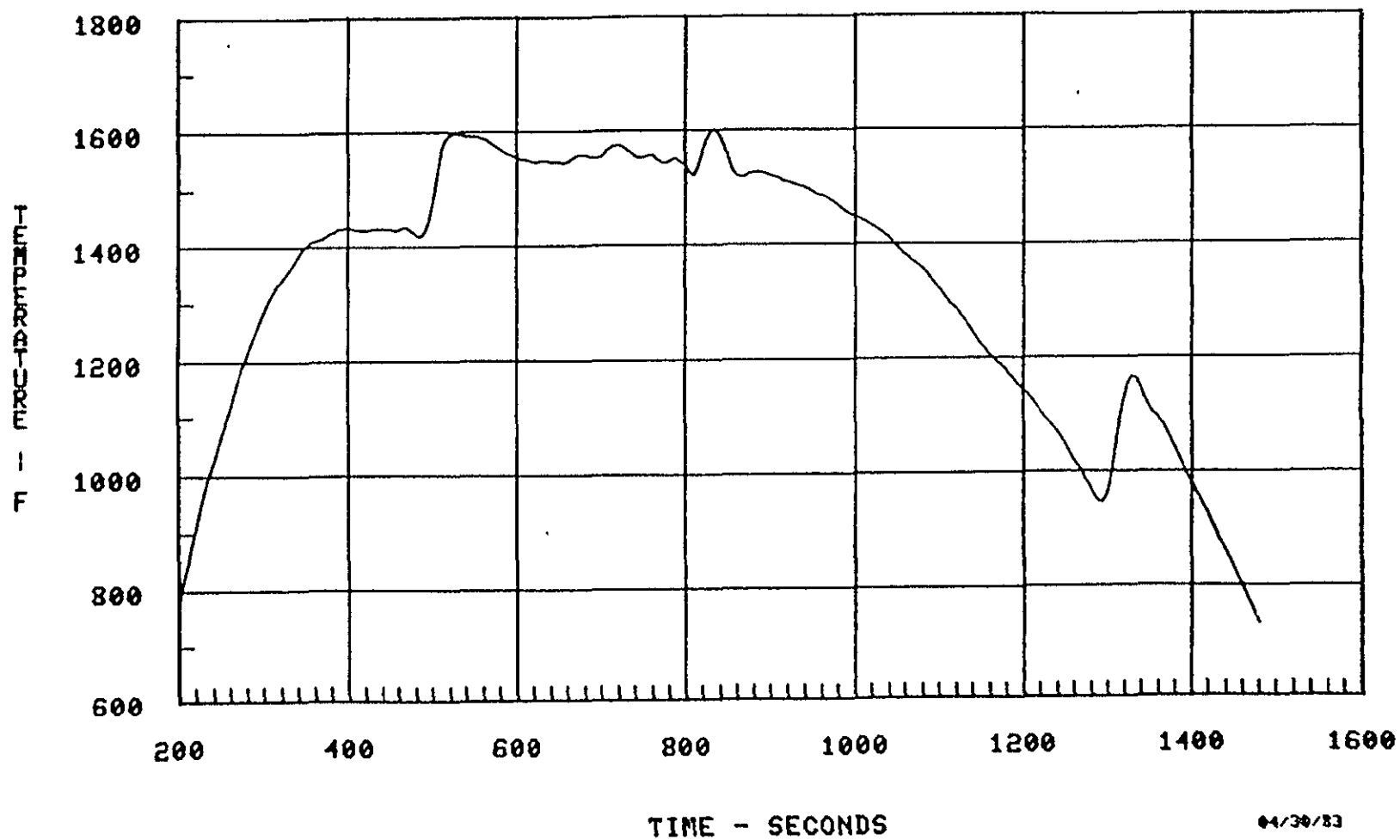
U07T9464A



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# STS-2 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

U07T9464A



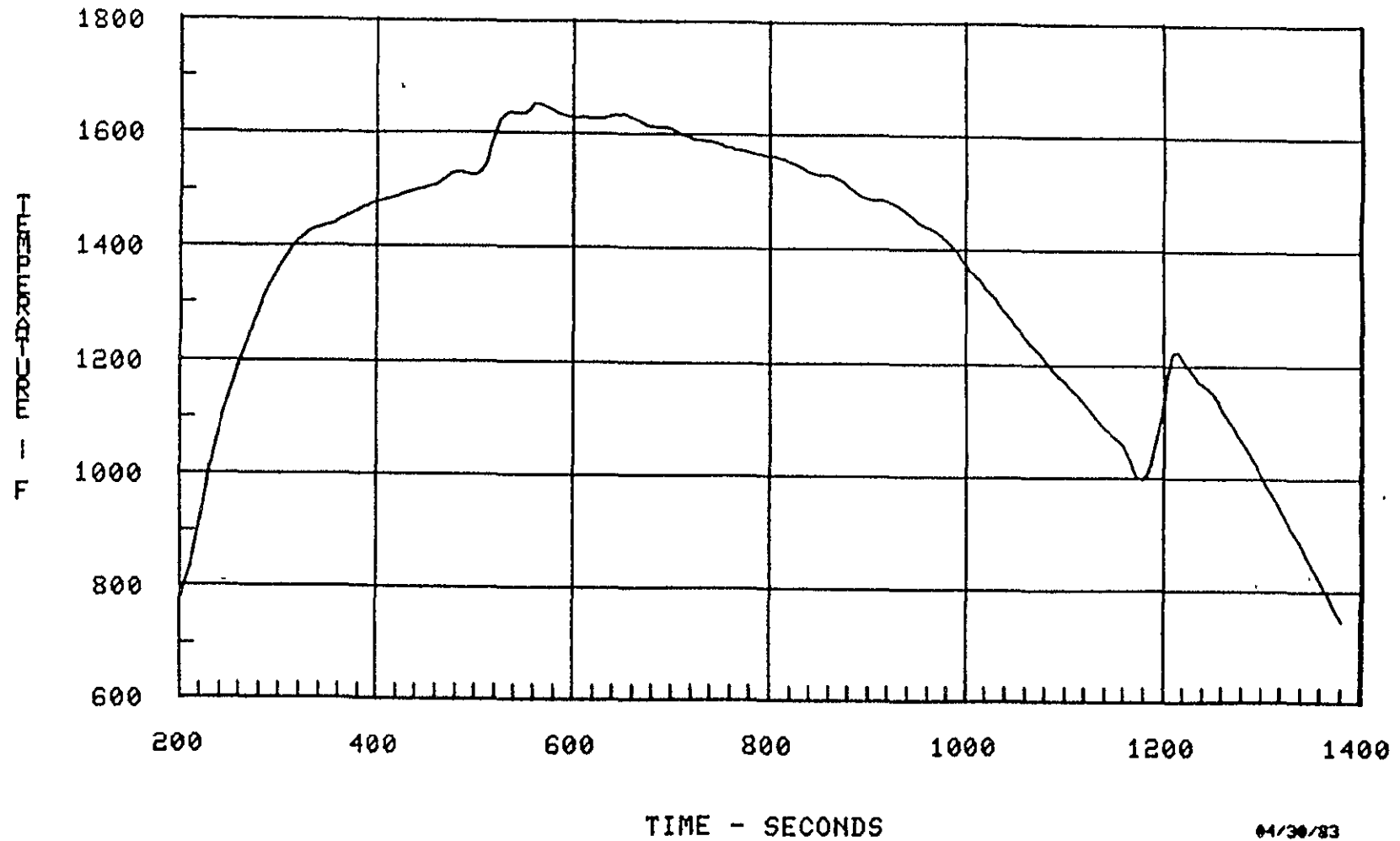
B-117

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OF POOR QUALITY

04/30/83

# STS-3 (107 FT LENGTH CL $X/L=0.20$ ) FLIGHT PARAMETER COMPARISO

U07T9464A

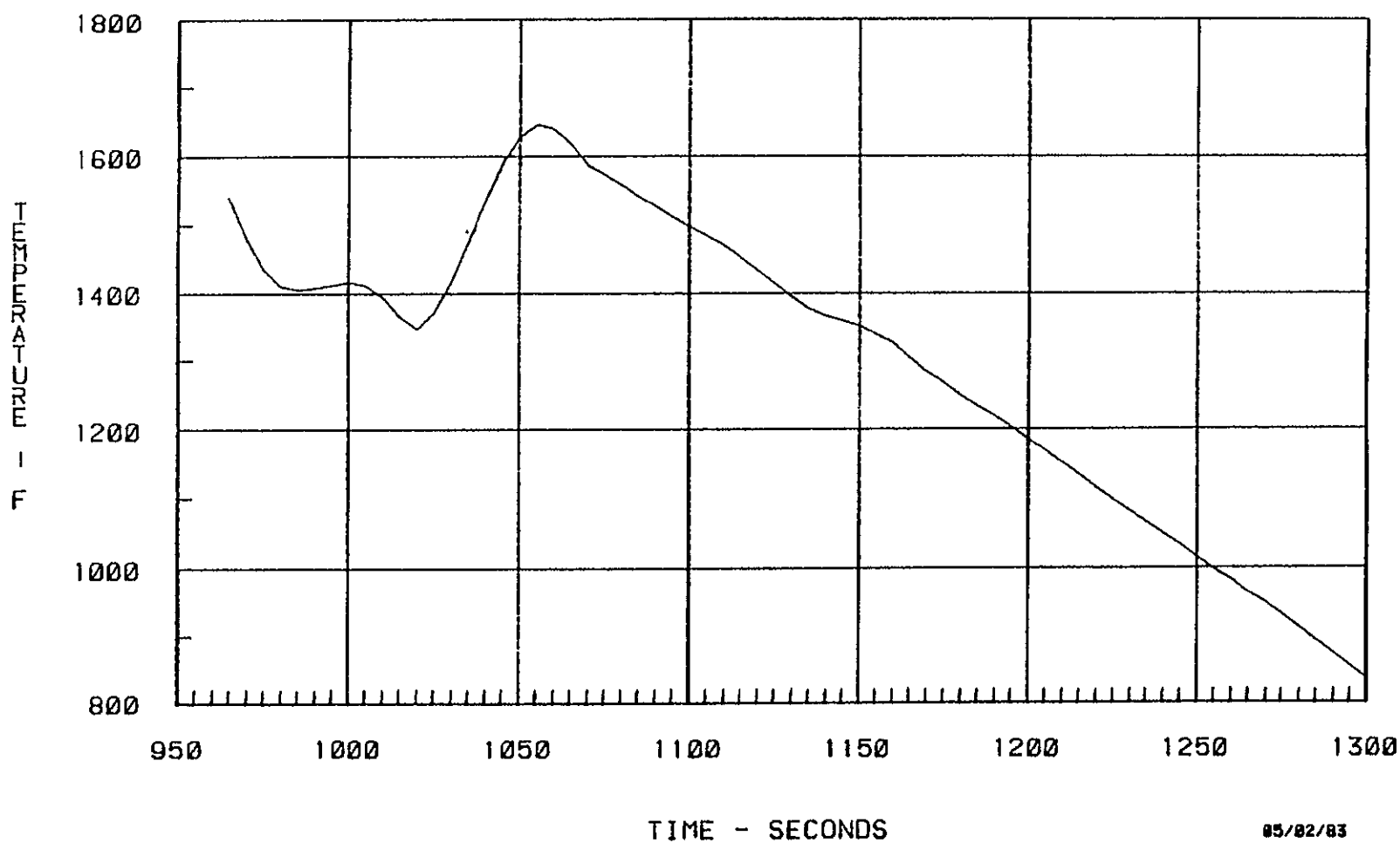


04/30/83

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STS-4 (107 FT LENGTH CL  $X/L=0.20$ ) FLIGHT PARAMETER COMPARISON

VB7T0464A



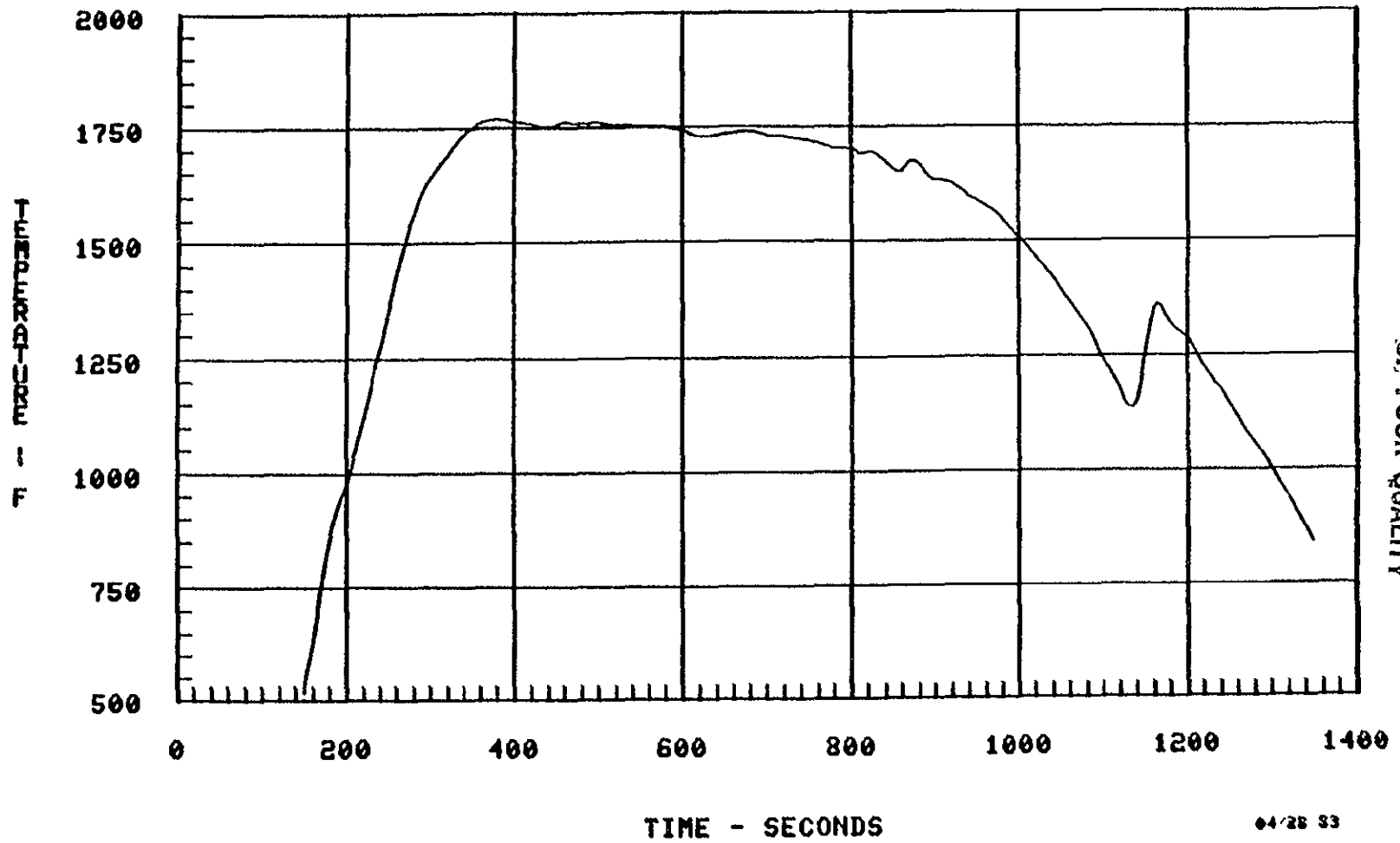
B-119

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05/02/83

# STS-5 (107 FT LENGTH CL X/L=0.20) FLIGHT PARAMETER COMPARISO

U87T9464A



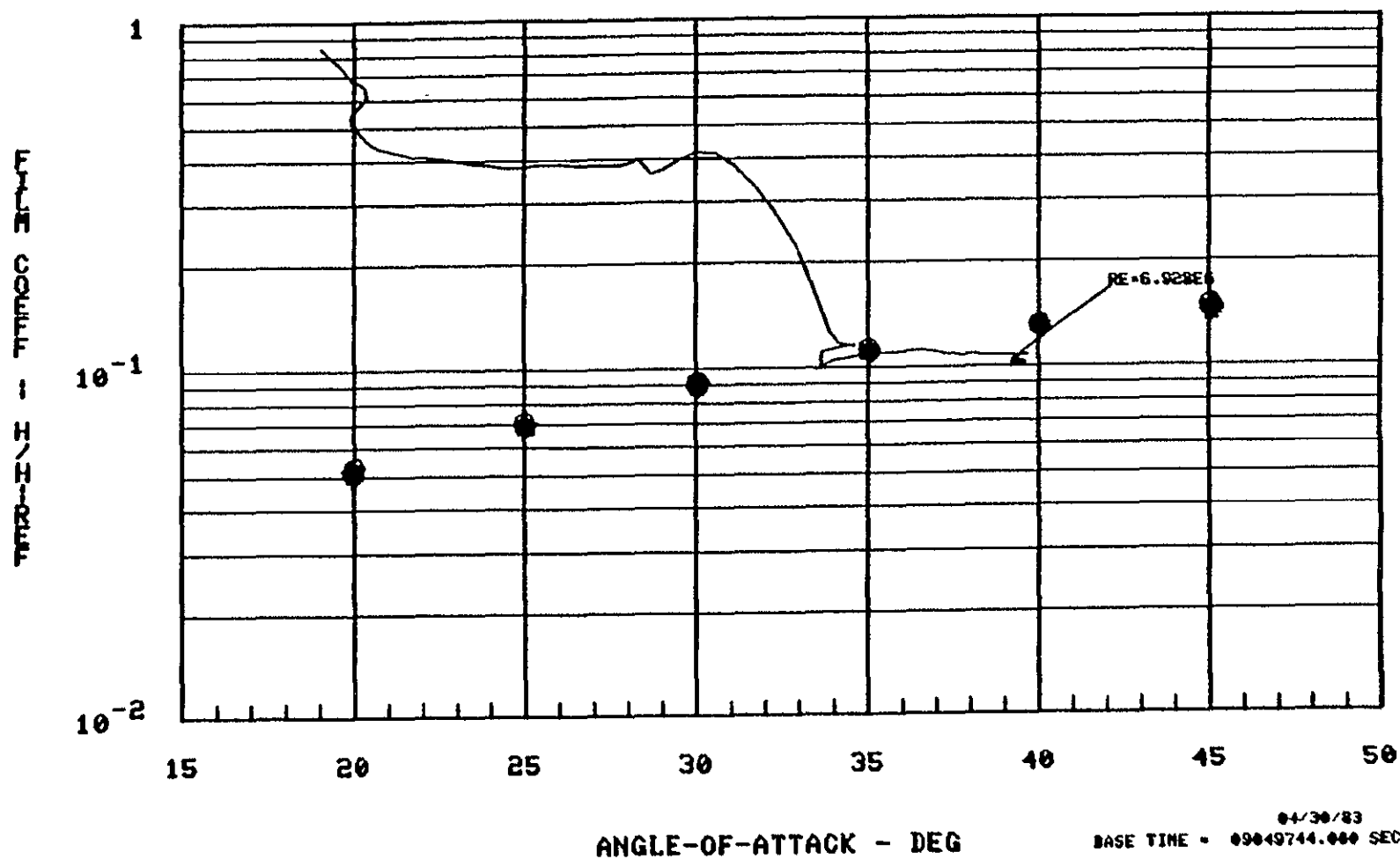


# STS-1 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U09T9381A/H-REF 1065-1460 SEC



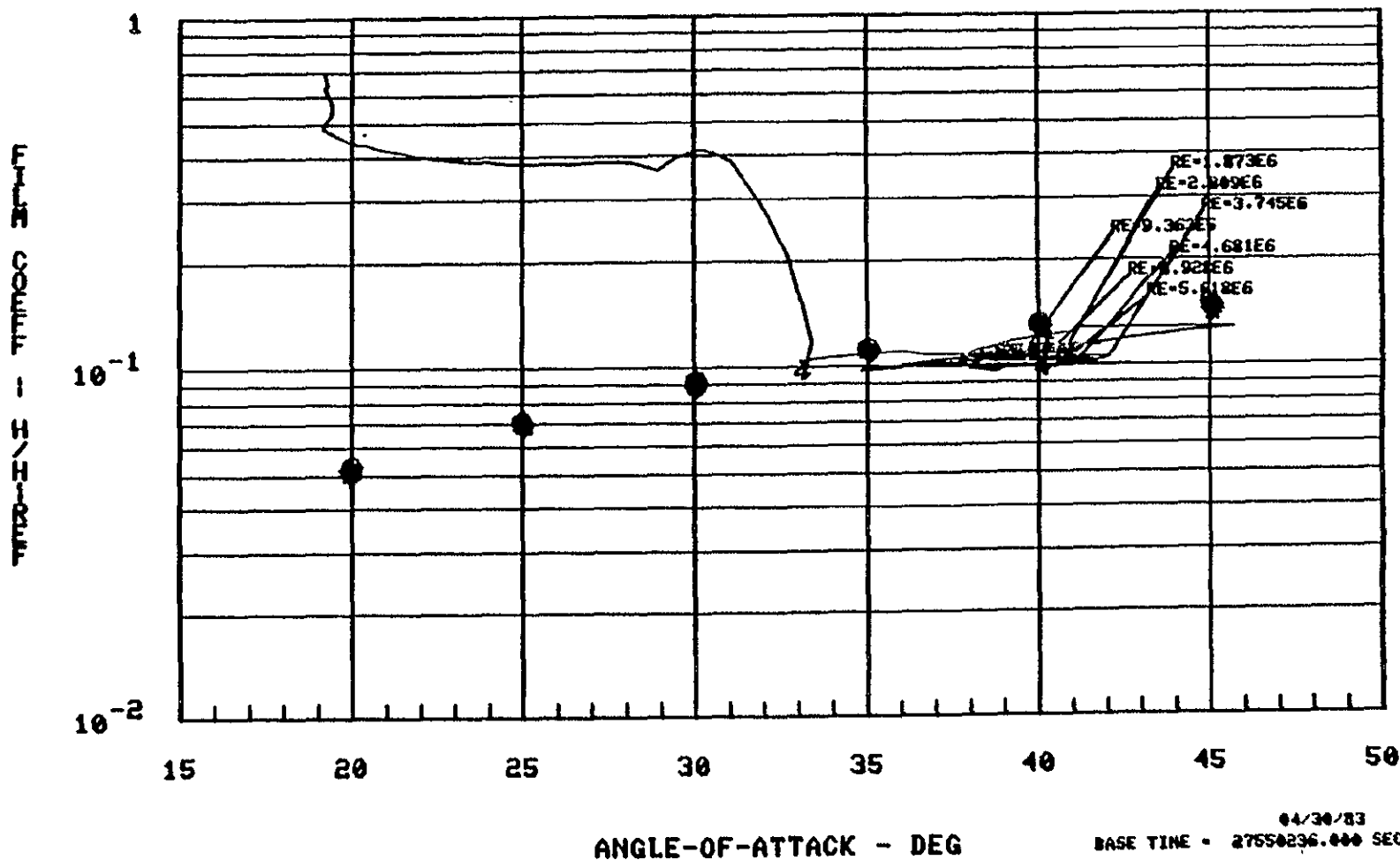
ORIGINAL PAGE IS  
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# STS-2 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9381A/H-REF 200-1480 SEC



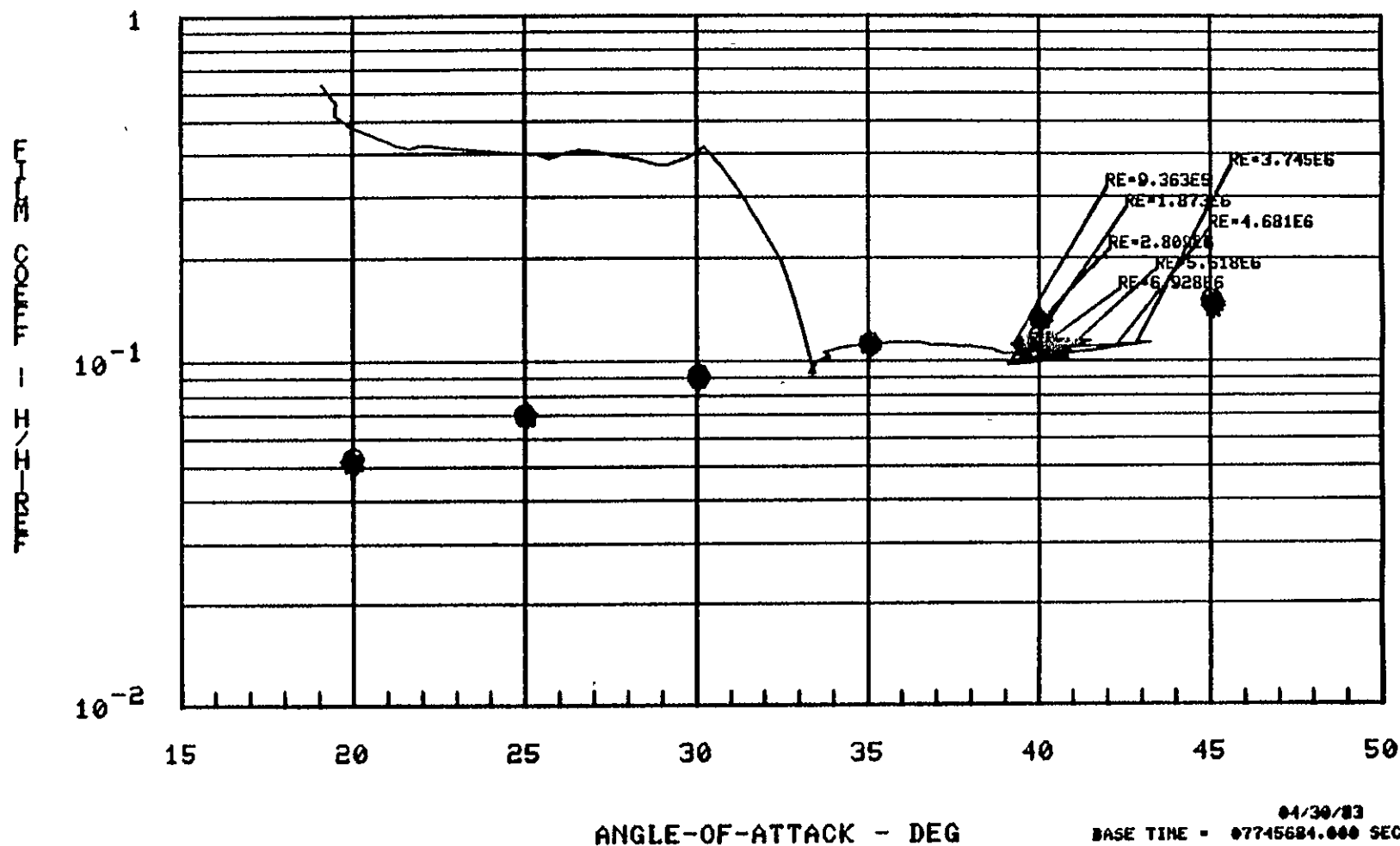
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OF POOR QUALITY

# STS-3 (107 FT LENGTH CL $X/L=0.26$ ) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U09T9381A/H-REF 200-1380 SEC



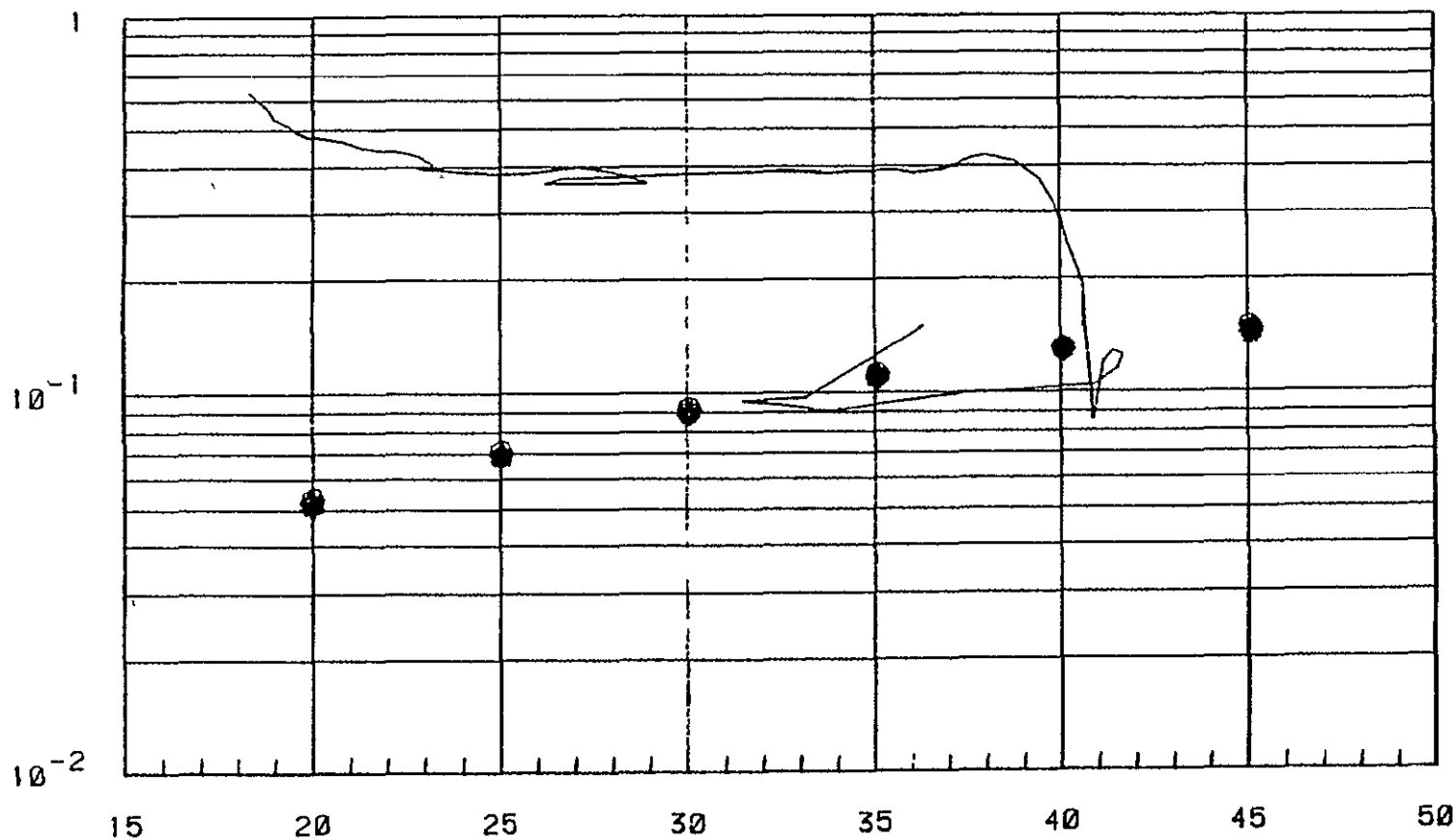
# STS-4 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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DH40 0.0175 SCALE RE = 0.5 E06  
 DH40 0.0175 SCALE RE = 1.0 E06  
 DH40 0.0175 SCALE RE = 1.5 E06  
 DH40 0.0175 SCALE RE = 2.0 E06  
 DH40 0.0175 SCALE RE = 2.5 E06  
 DH40 0.0175 SCALE RE = 3.0 E06  
 DH40 0.0175 SCALE RE = 3.7 E06

V00T0301A/H-REF 065-1300 SEC

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ANGLE-OF-ATTACK - DEG

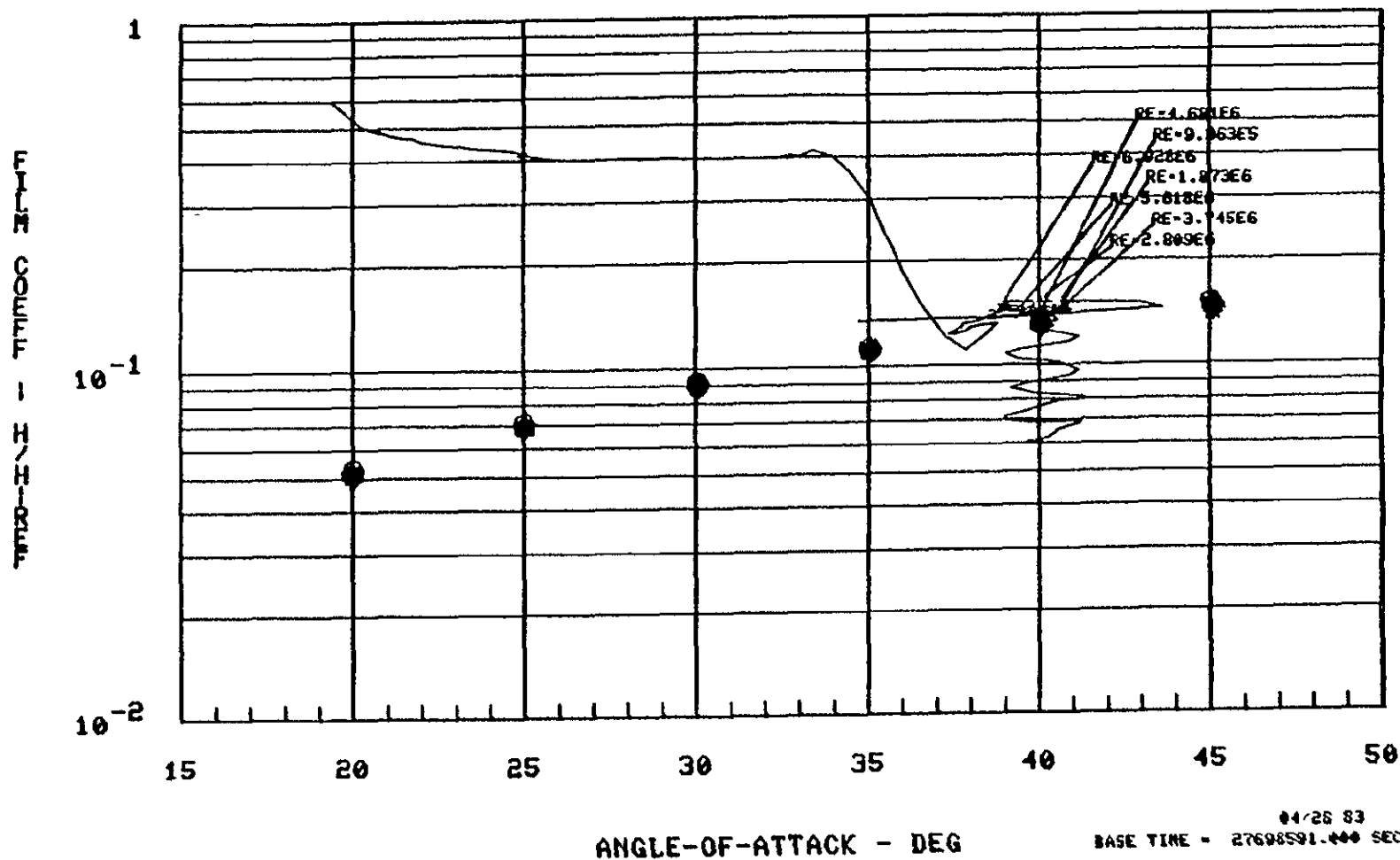
05/02/83  
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# STS-5 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

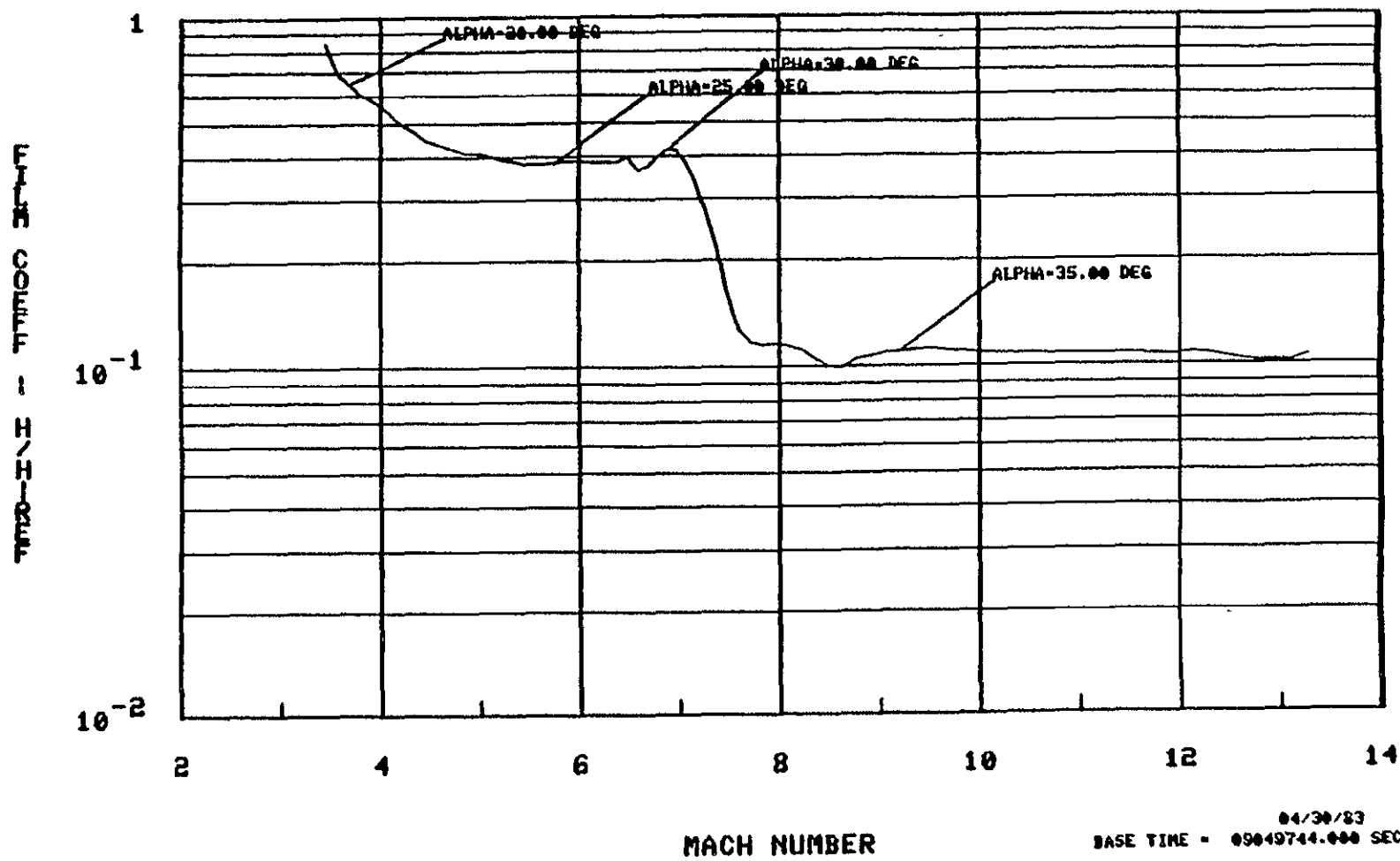
U09T9381A/H-REF 150-1350 SEC



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# STS-1 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

U09T9381A/H-REF 1065-1460 SEC

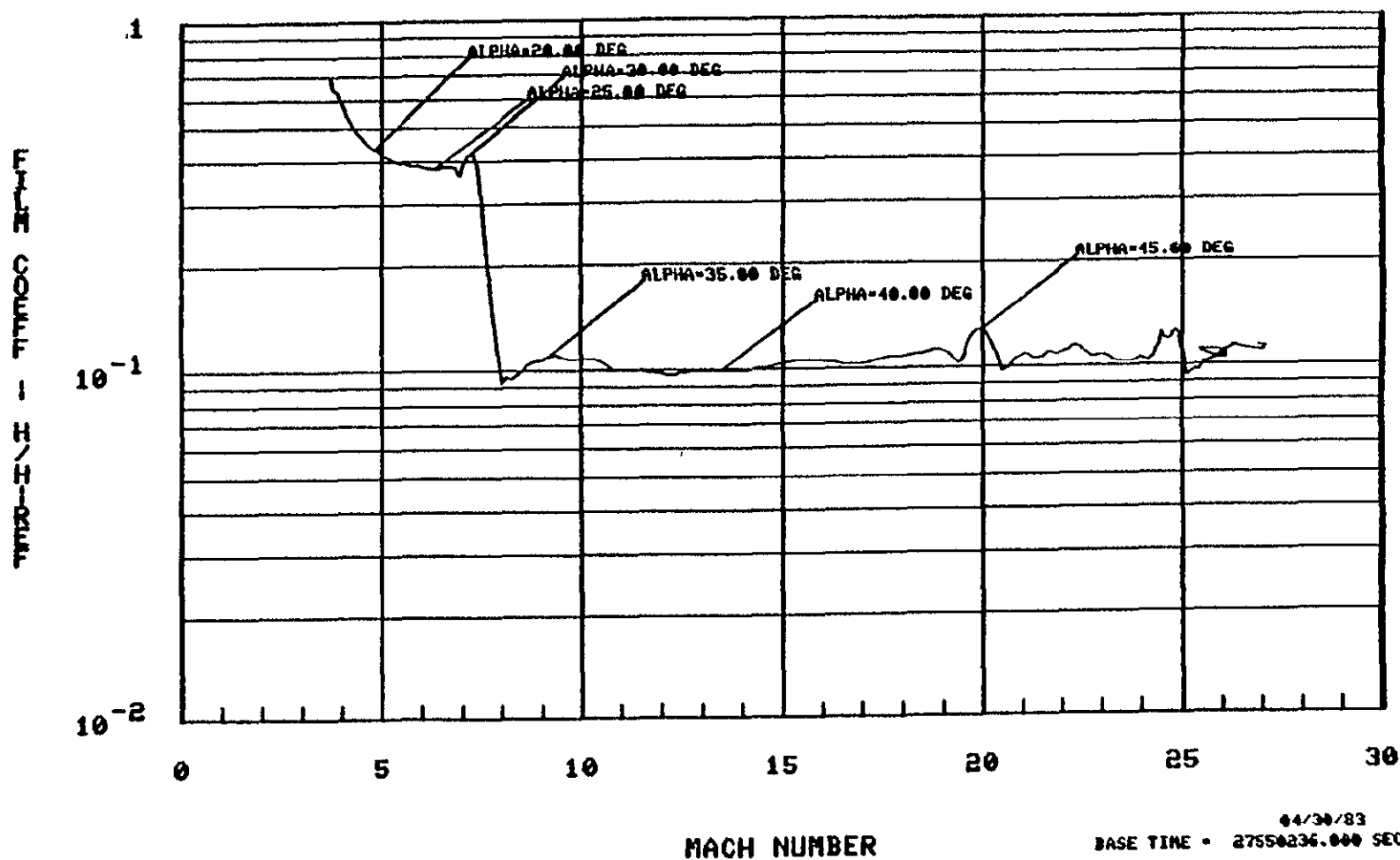


B-126

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# STS-2 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

U09T9381A/H-REF 200-1480 SEC

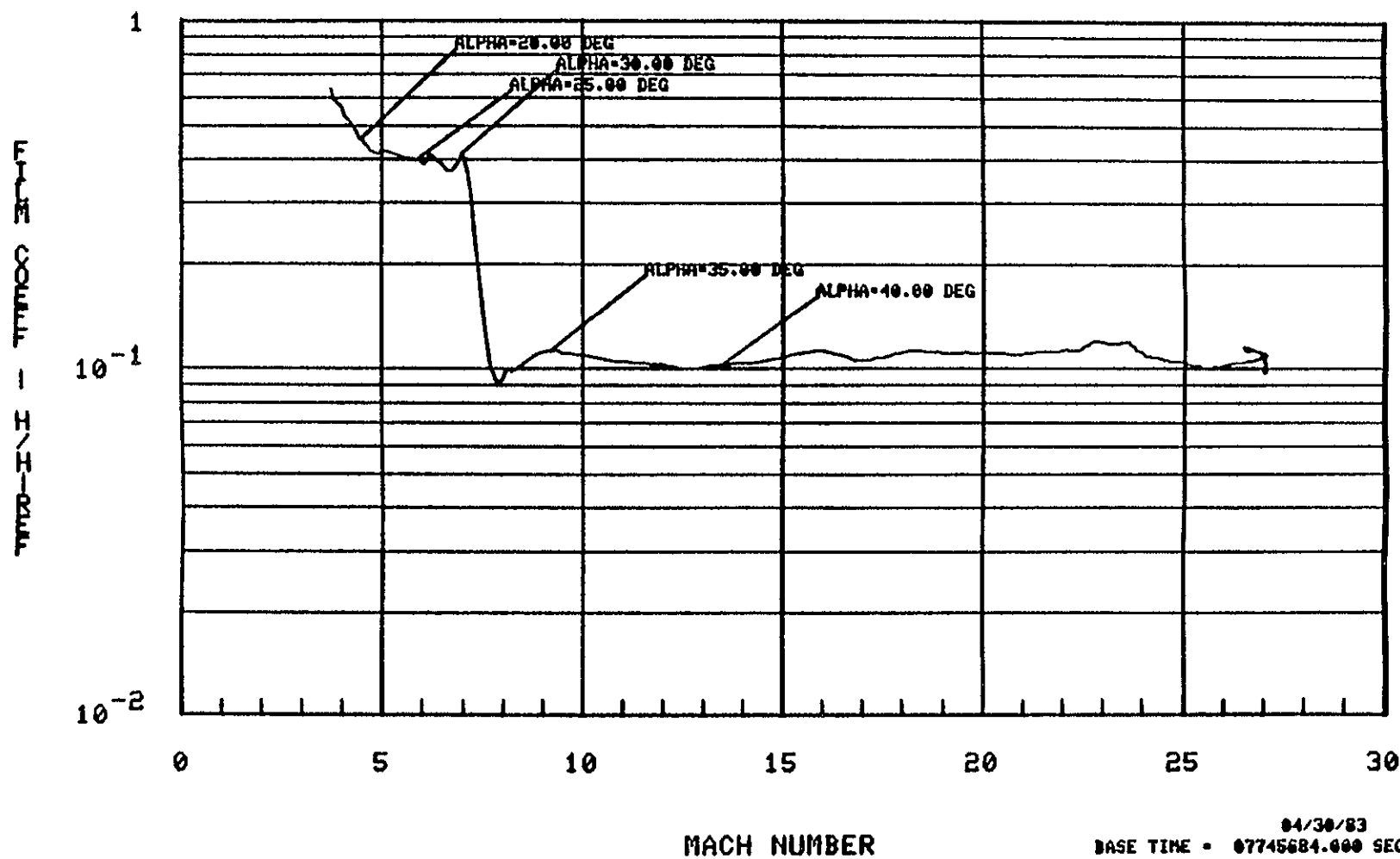


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B-127

# STS-3 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

U09T9381A/H-REF 200-1380 SEC



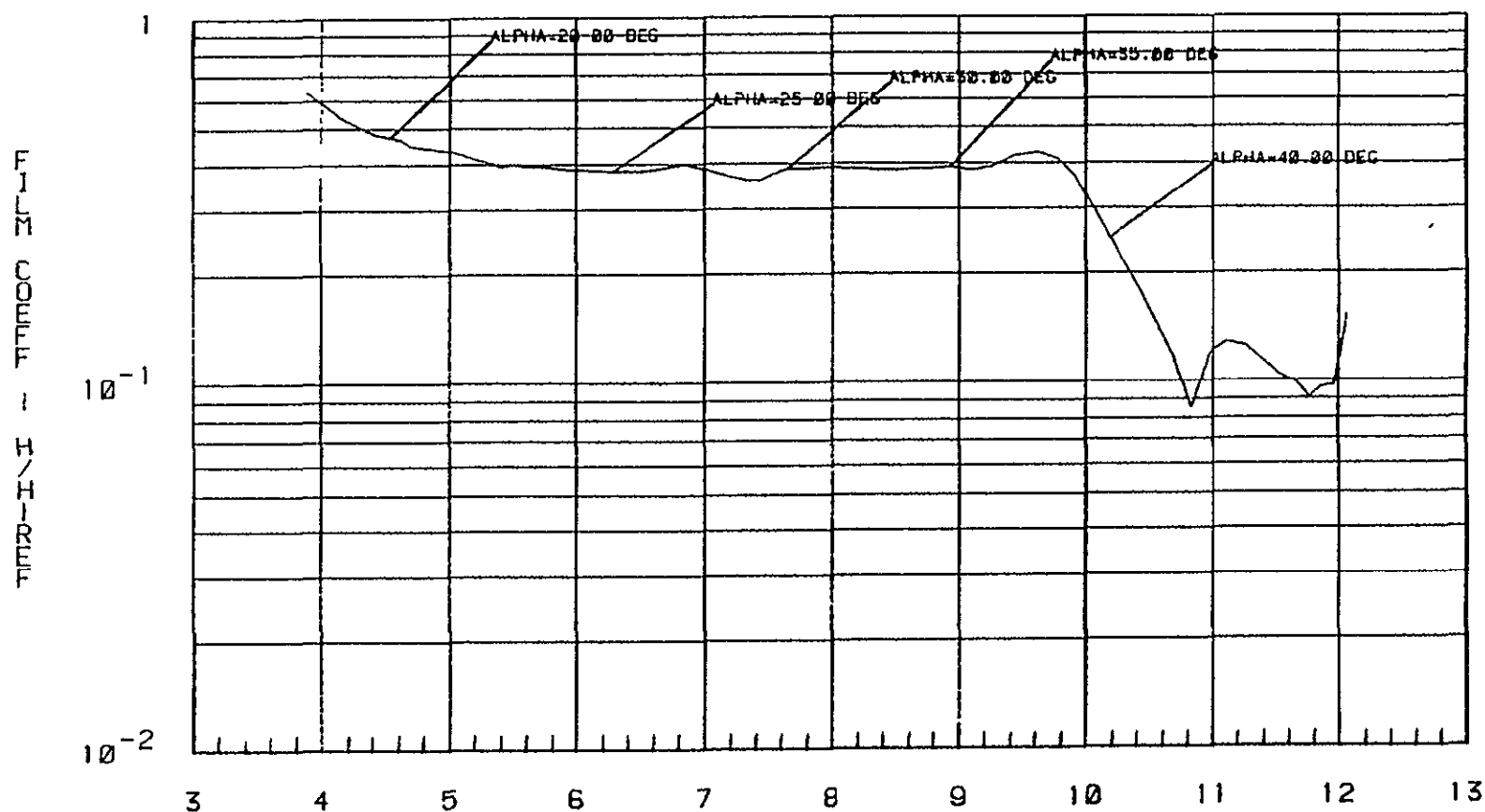
B-128

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# STS-4 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

V09T0301A/H-REF 065-1300 SEC



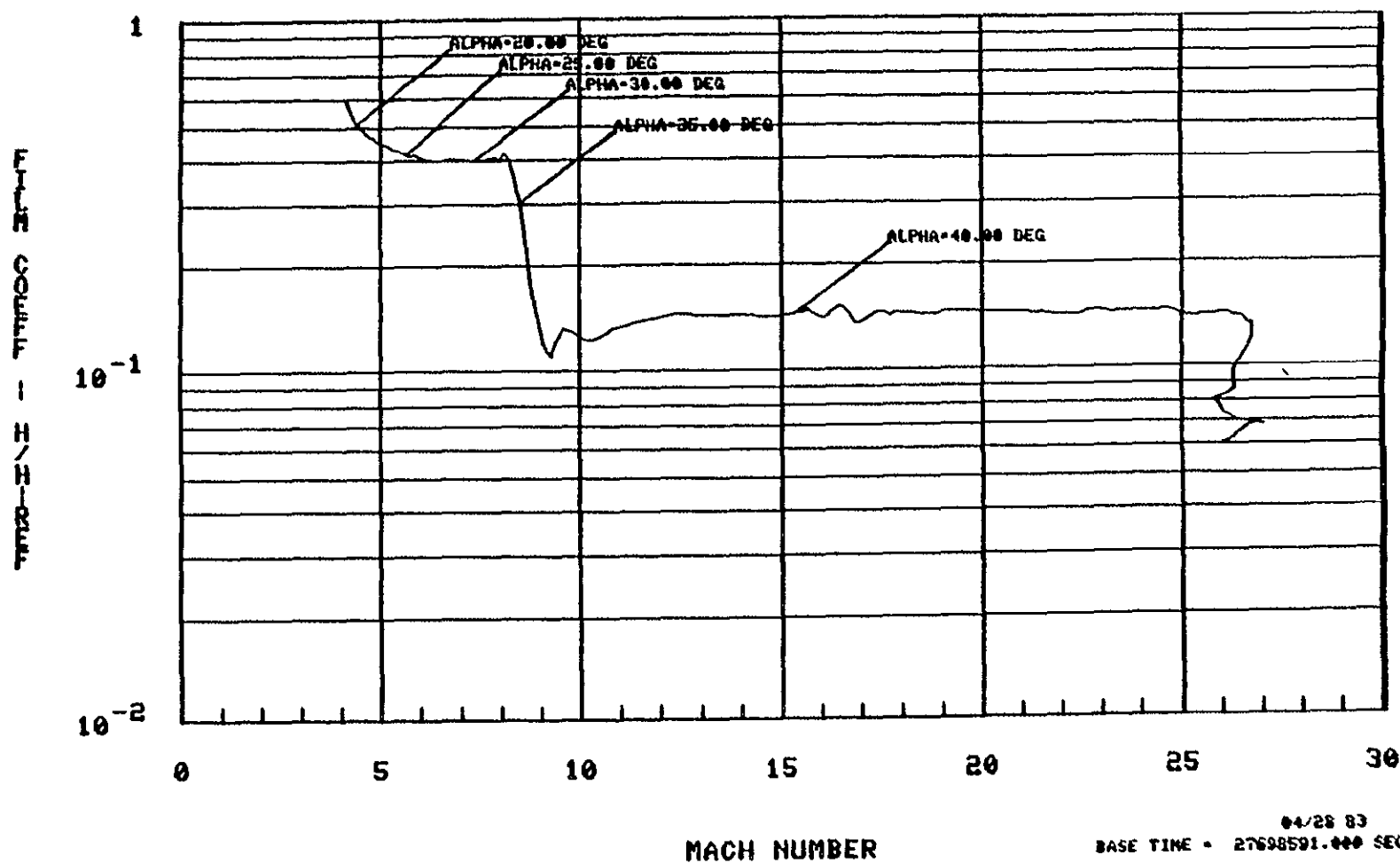
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MACH NUMBER

05/02/83  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

U09T9381A/H-REF 150-1350 SEC



B-130

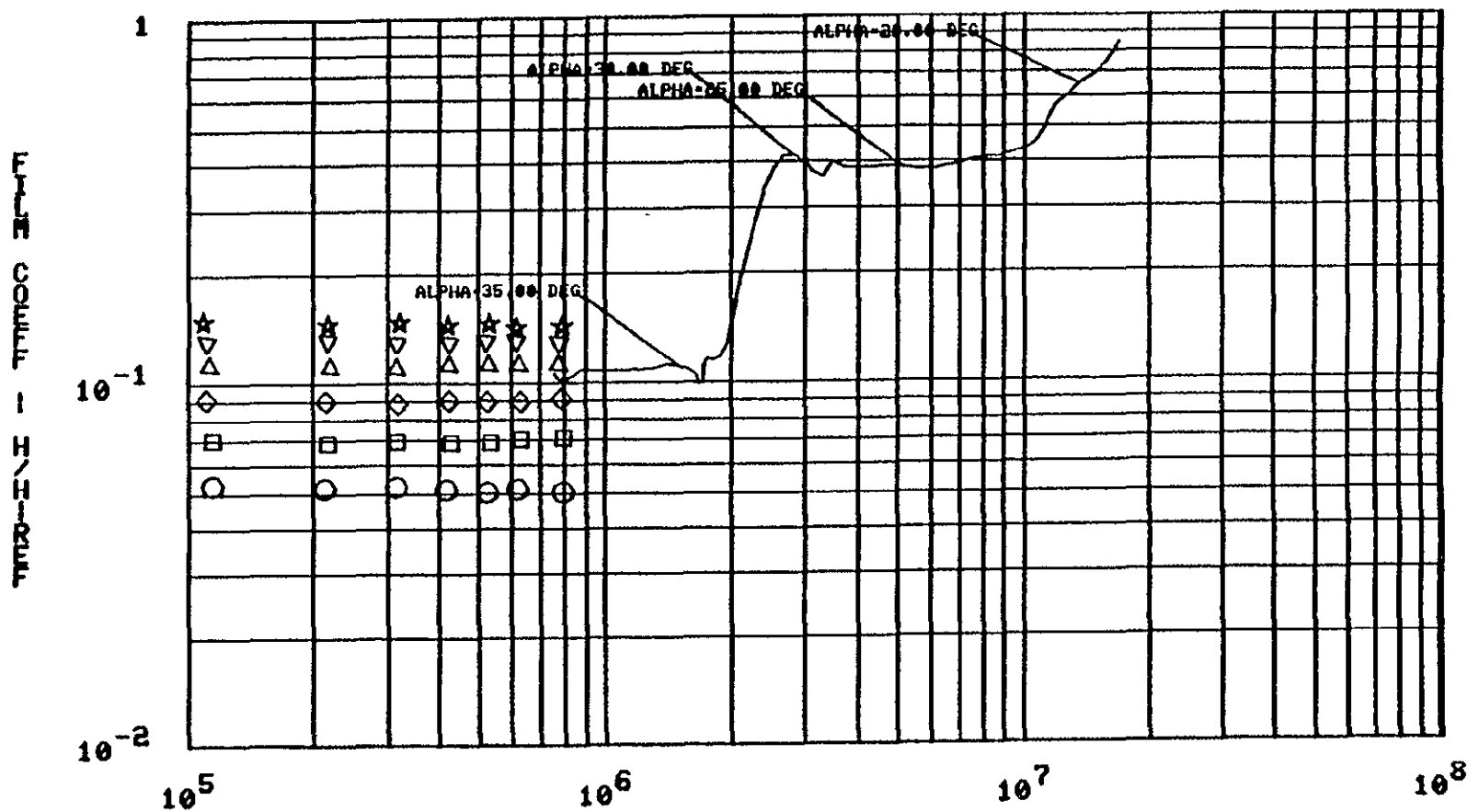
ORIGINAL PAGE IS  
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# STS-1 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9381A/H-REF 1065-1460 SEC



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REYNOLDS NUMBER (NS)

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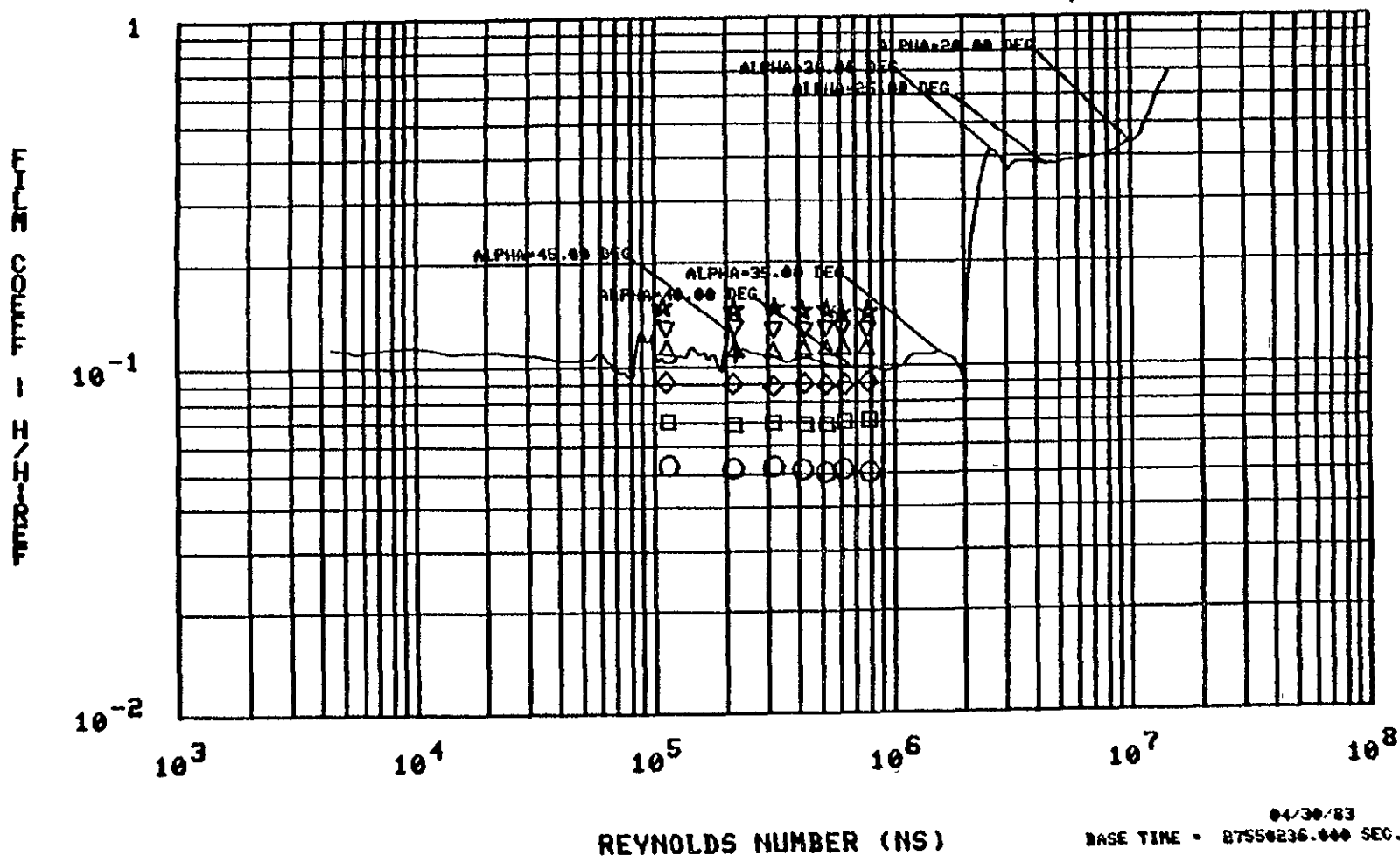
ORIGINAL PAGE IS  
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# STS-2 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9381A/H-REF 200-1480 SEC



B-132

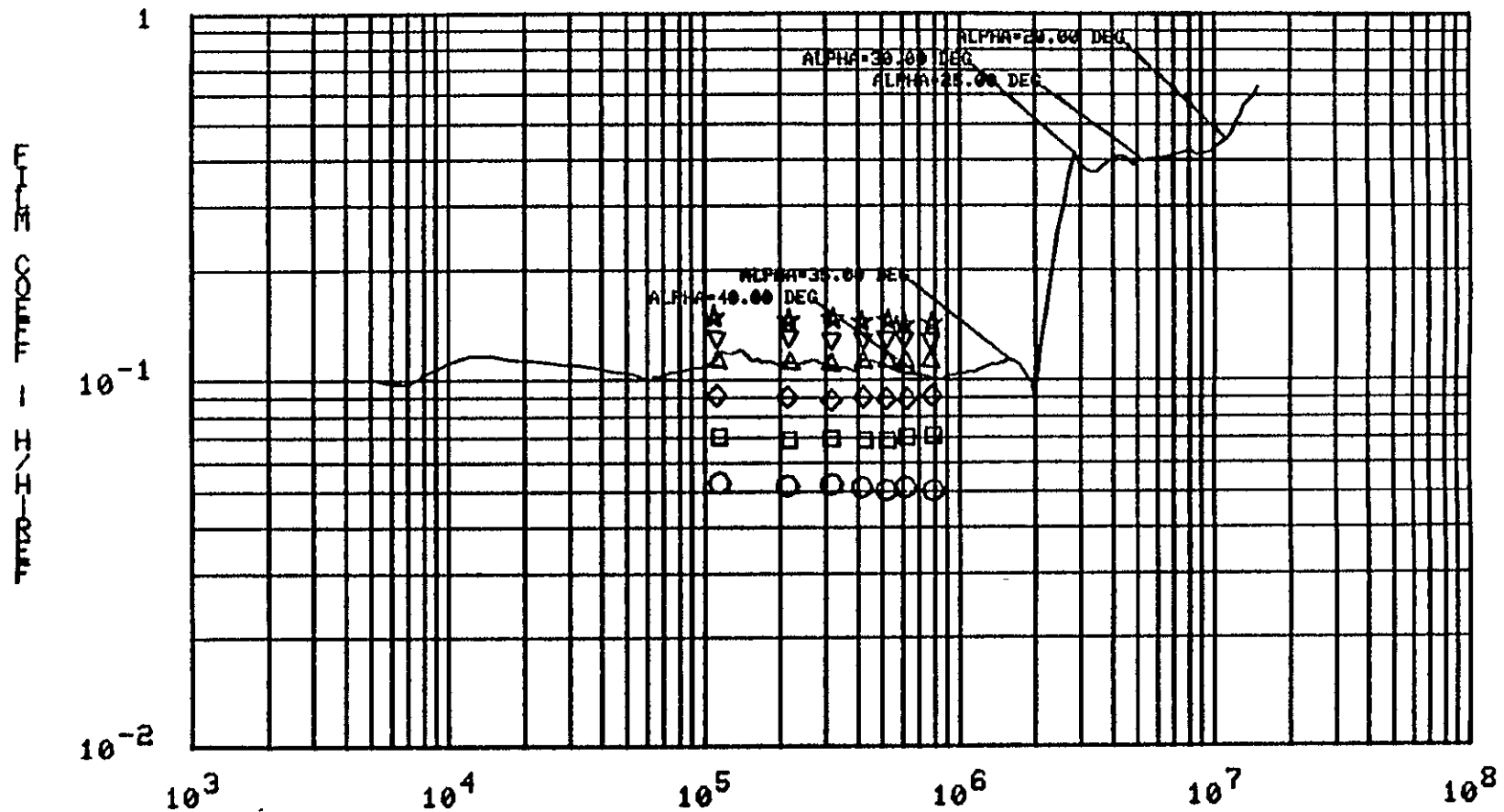
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# STS-3 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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0H49 ALPHA = 20 DEGREES  
0H49 ALPHA = 25 DEGREES  
0H49 ALPHA = 30 DEGREES  
0H49 ALPHA = 35 DEGREES  
0H49 ALPHA = 40 DEGREES  
0H49 ALPHA = 45 DEGREES

U09T9381A/H-REF 200-1380 SEC



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QUALITY

B-733

REYNOLDS NUMBER (NS)

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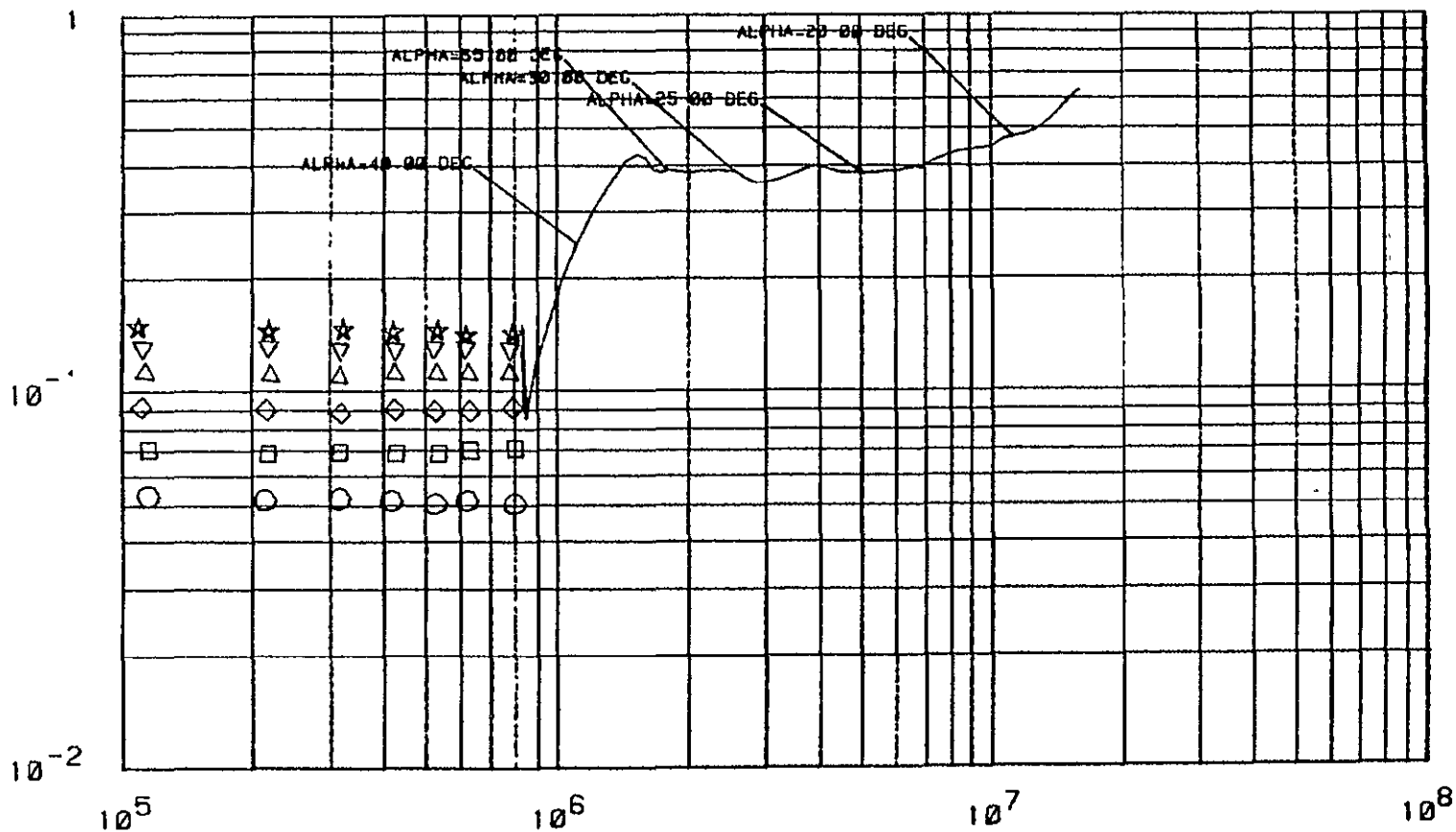
# STS-4 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH40 ALPHA = 20 DEGREES  
OH40 ALPHA = 25 DEGREES  
OH40 ALPHA = 30 DEGREES  
OH40 ALPHA = 35 DEGREES  
OH40 ALPHA = 40 DEGREES  
OH40 ALPHA = 45 DEGREES

V80T0301A/H-REF 965-1300 SEC

UNIT CIRCLE - H-H-CELL



B-134

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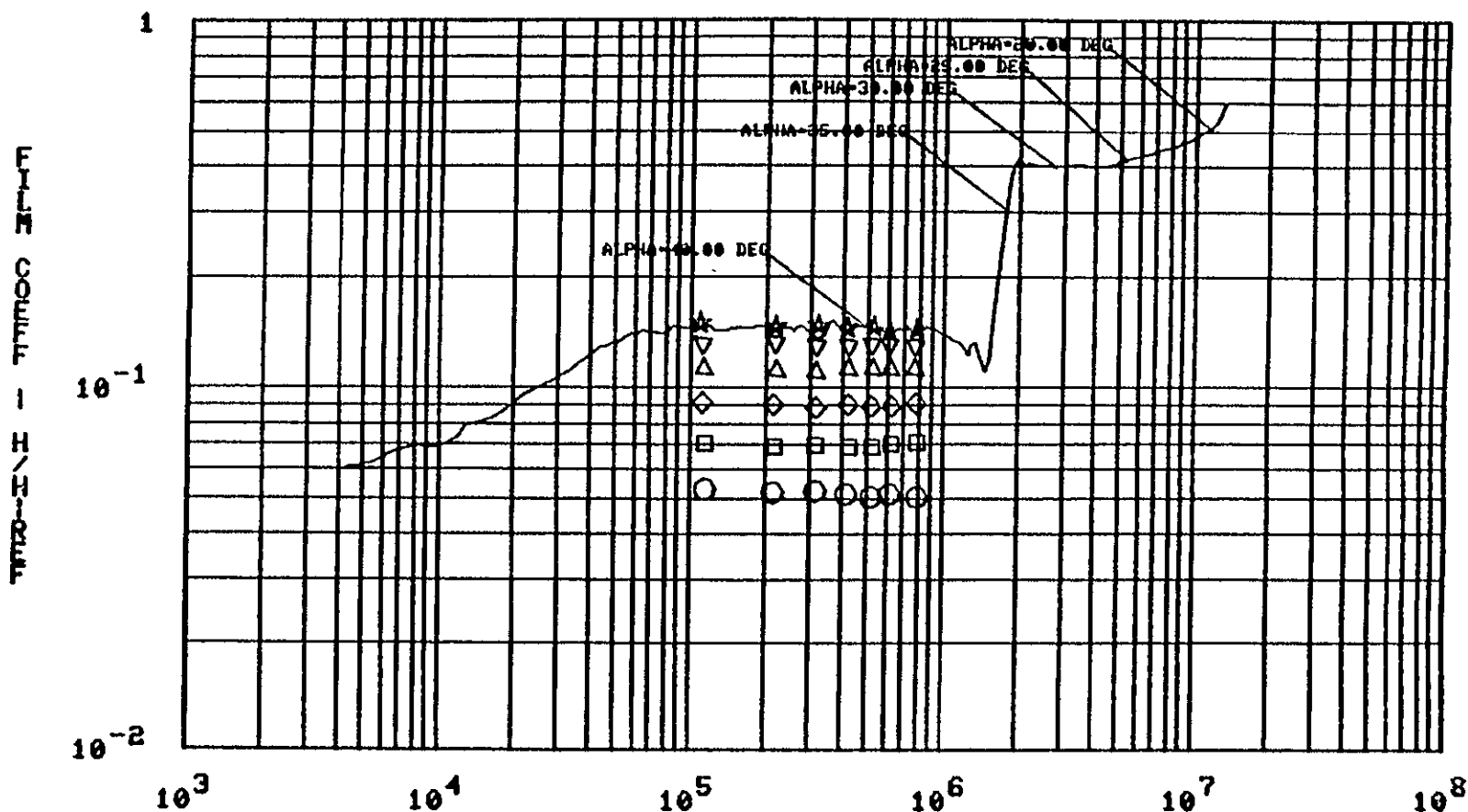
85/02/03  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9381A/H-REF 150-1350 SEC



B-135

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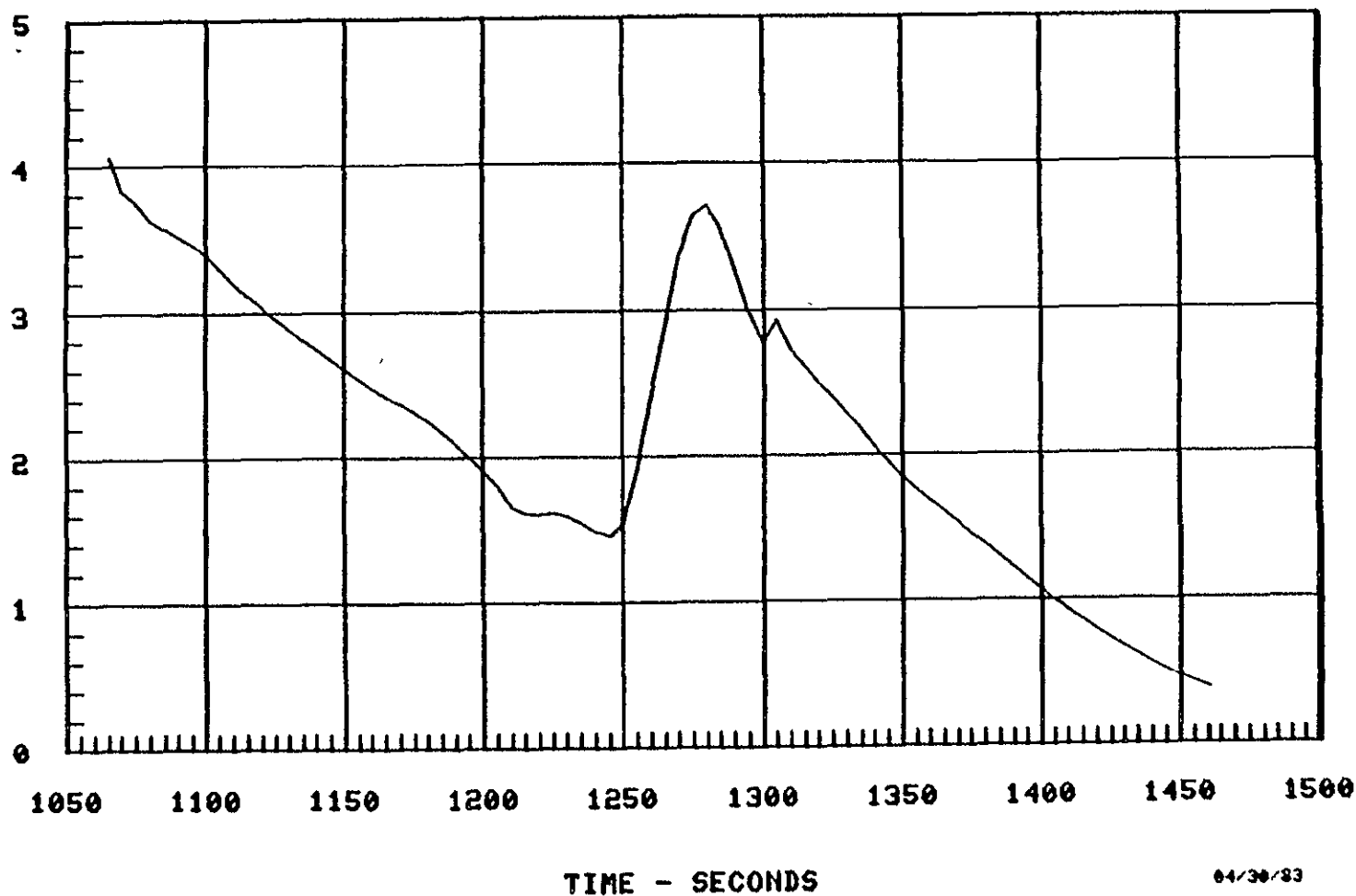
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U09T9381A

WING - F-105 - 107 FT LENGTH - 0.26 X/L



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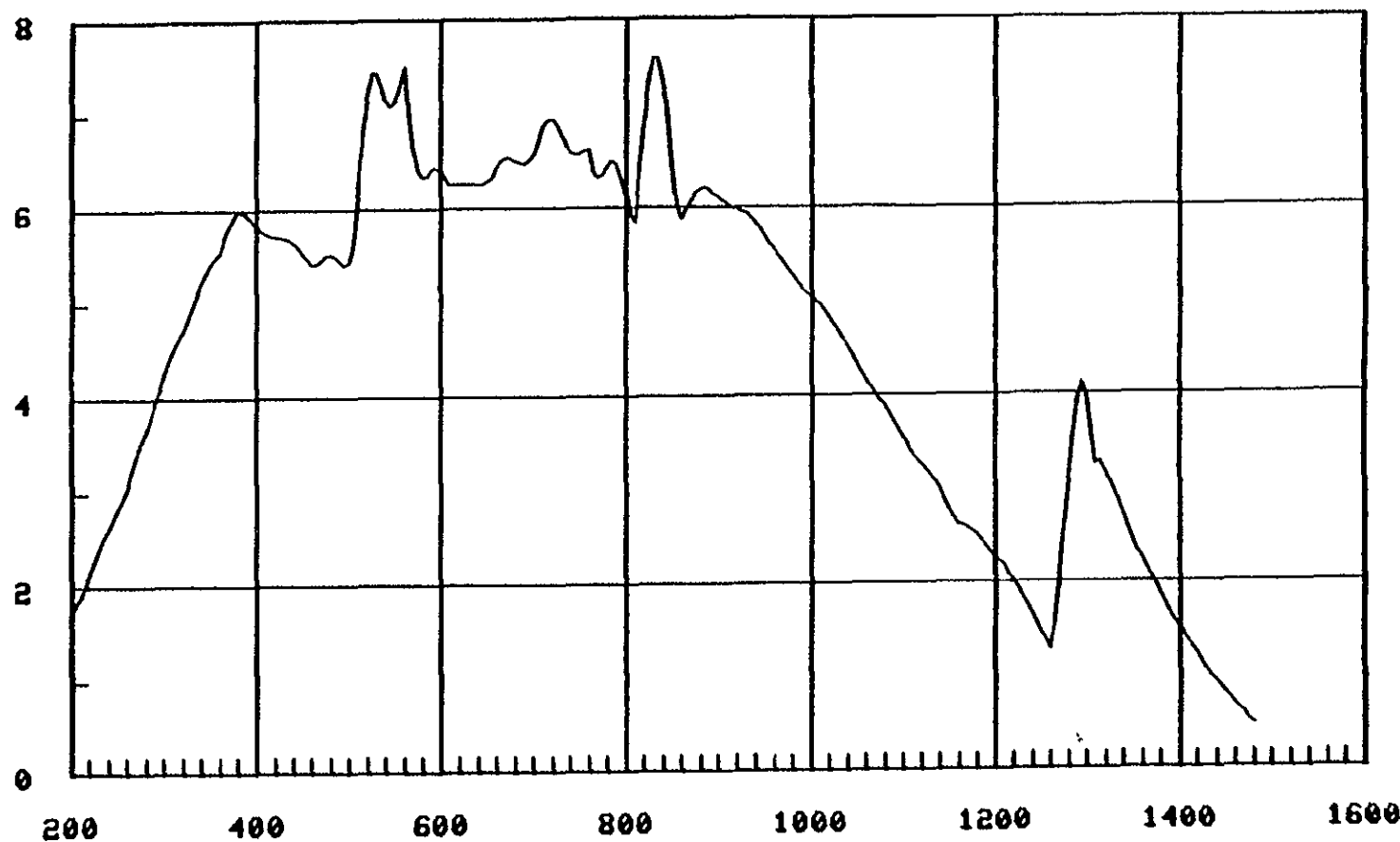
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U09T9381A

HEIGHTS REF - 800 FT - 500

B-137

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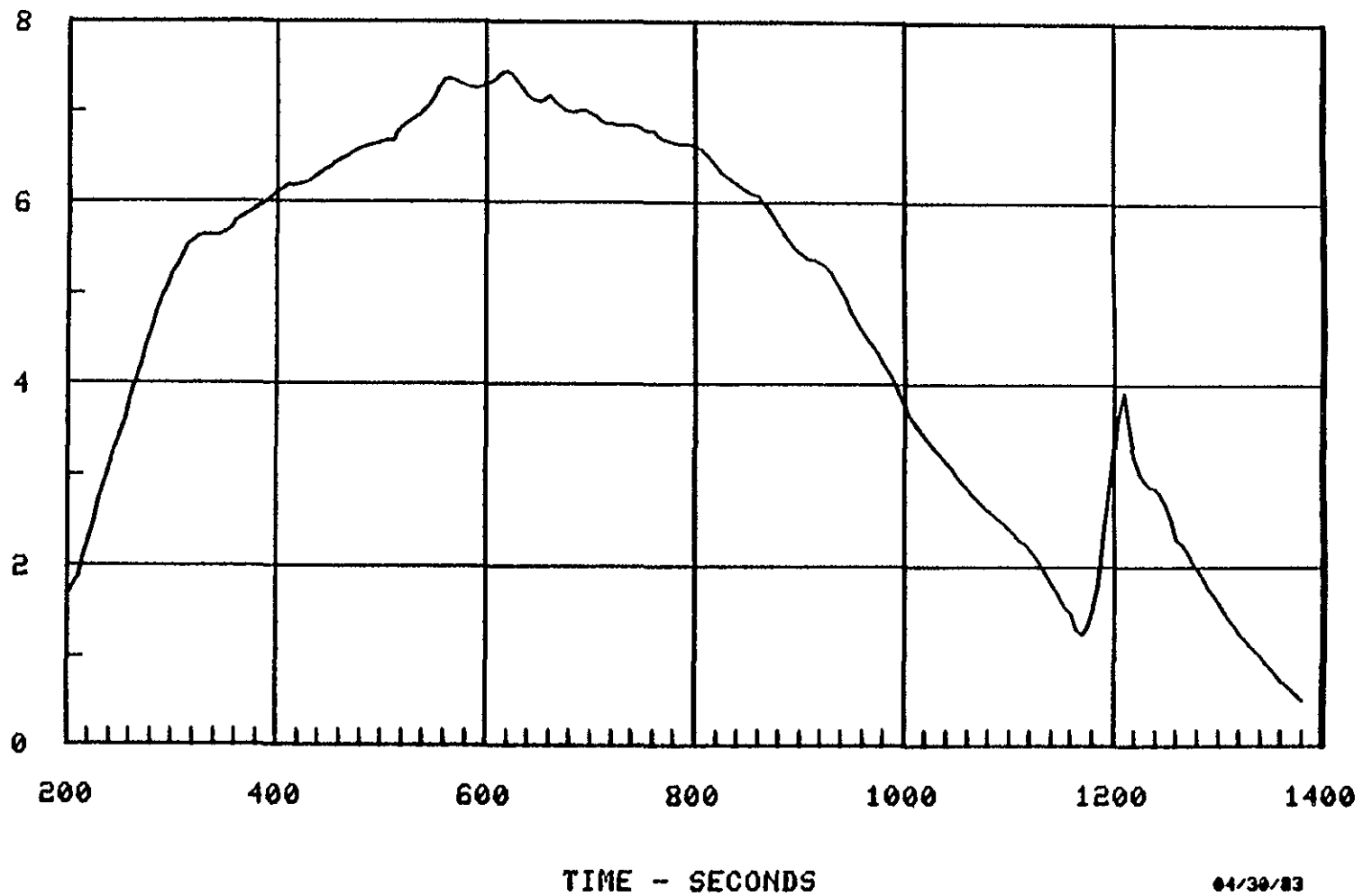
04/30/83

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U09T9381A

INTEGRATED - 1000 - 1000 - 1000

B-138

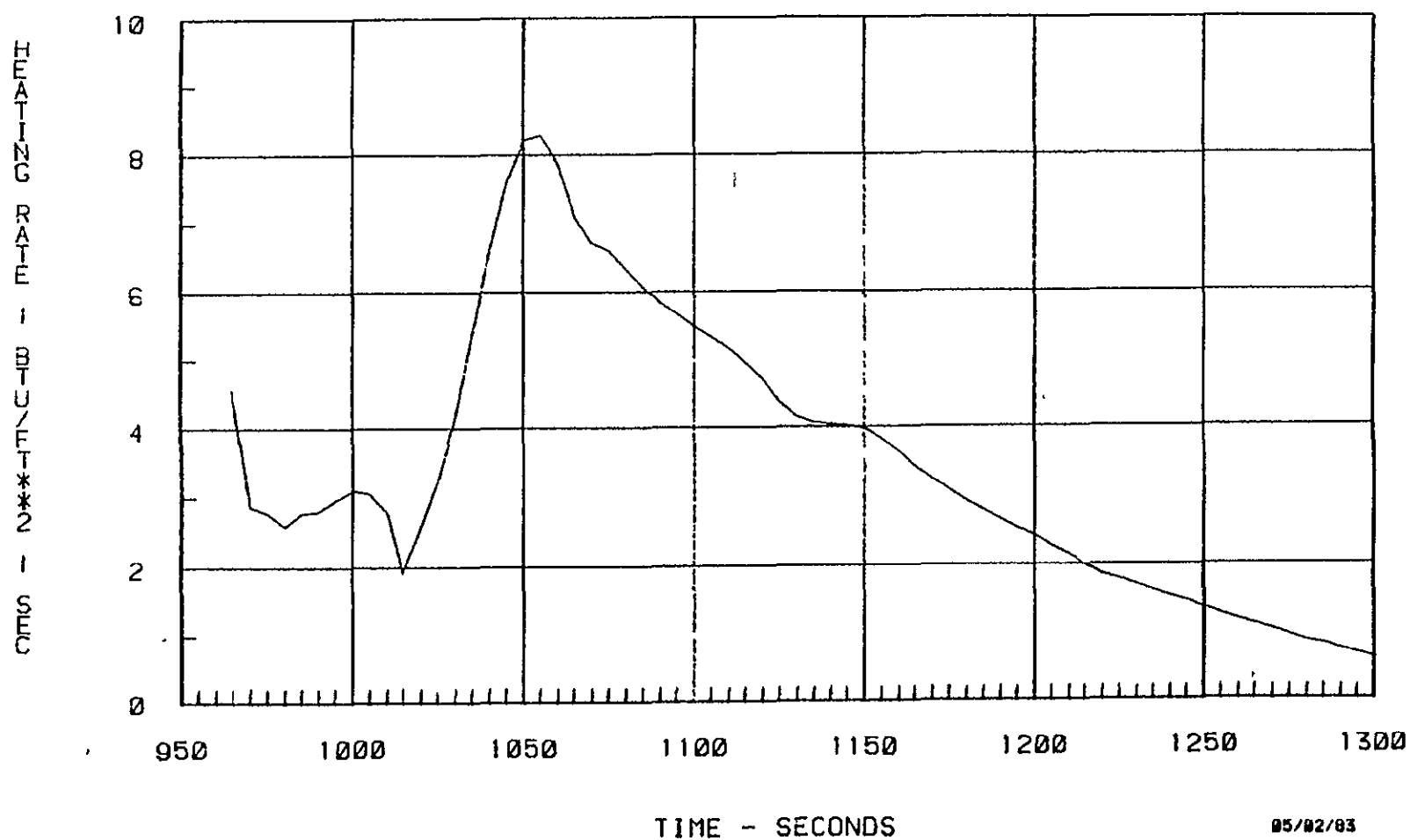


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04/30/83

# STS-4 (107 FT LENGTH CL $X/L=0.26$ ) FLIGHT PARAMETER COMPARISO

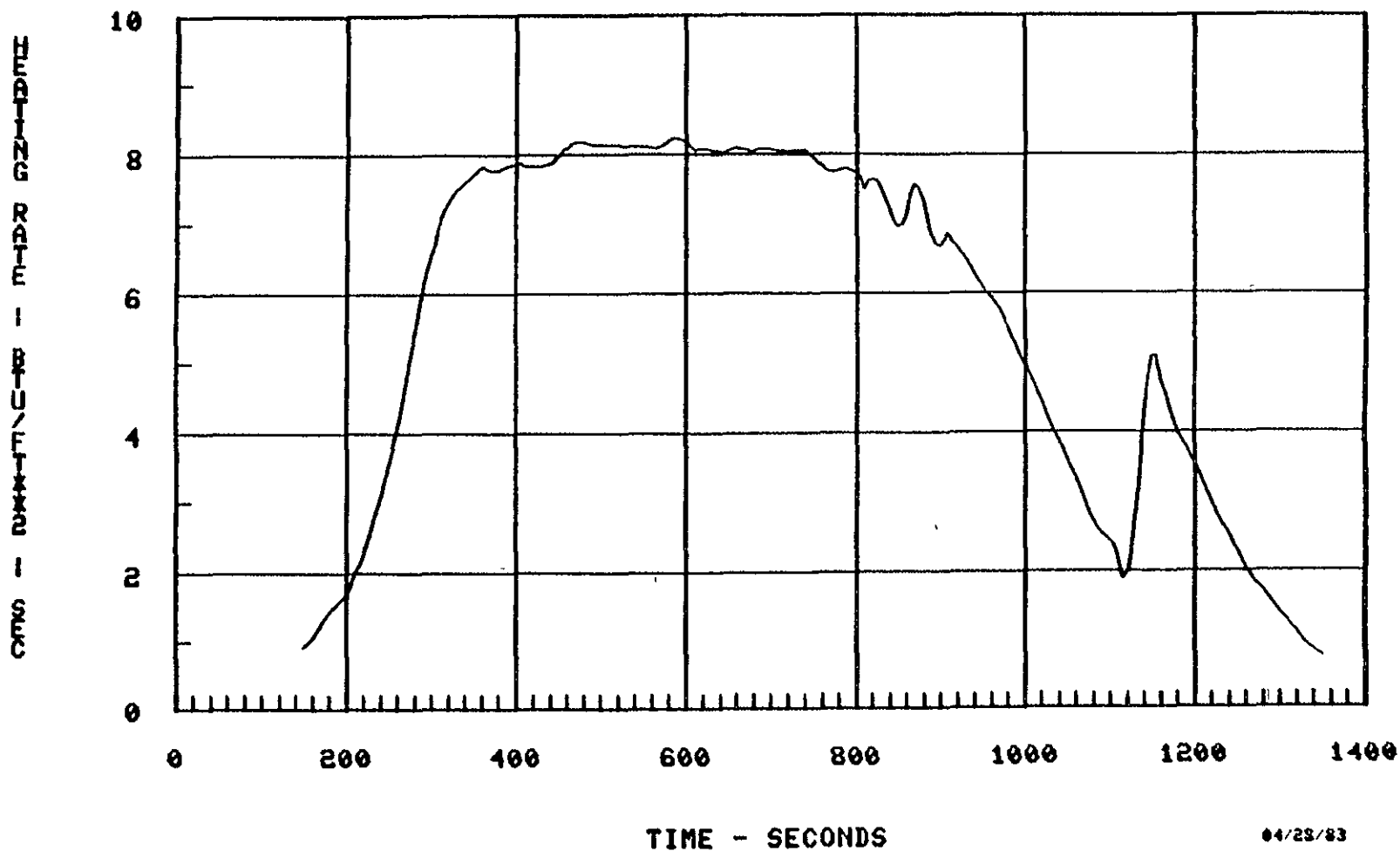
———— V09T0381A



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# STS-5 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

U09T9381A



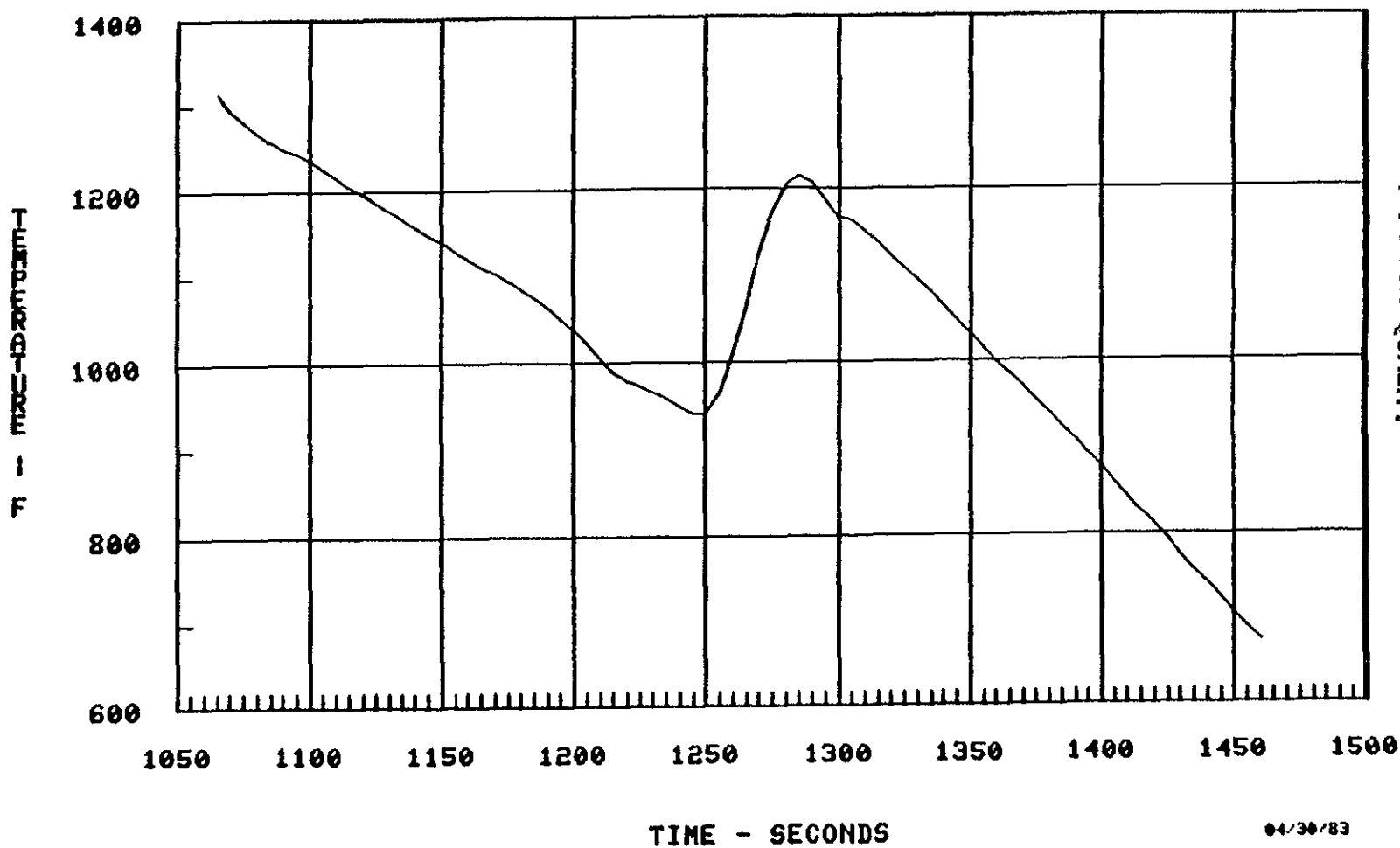
B-140

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04/23/83

# STS-1 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISON

U09T9381A



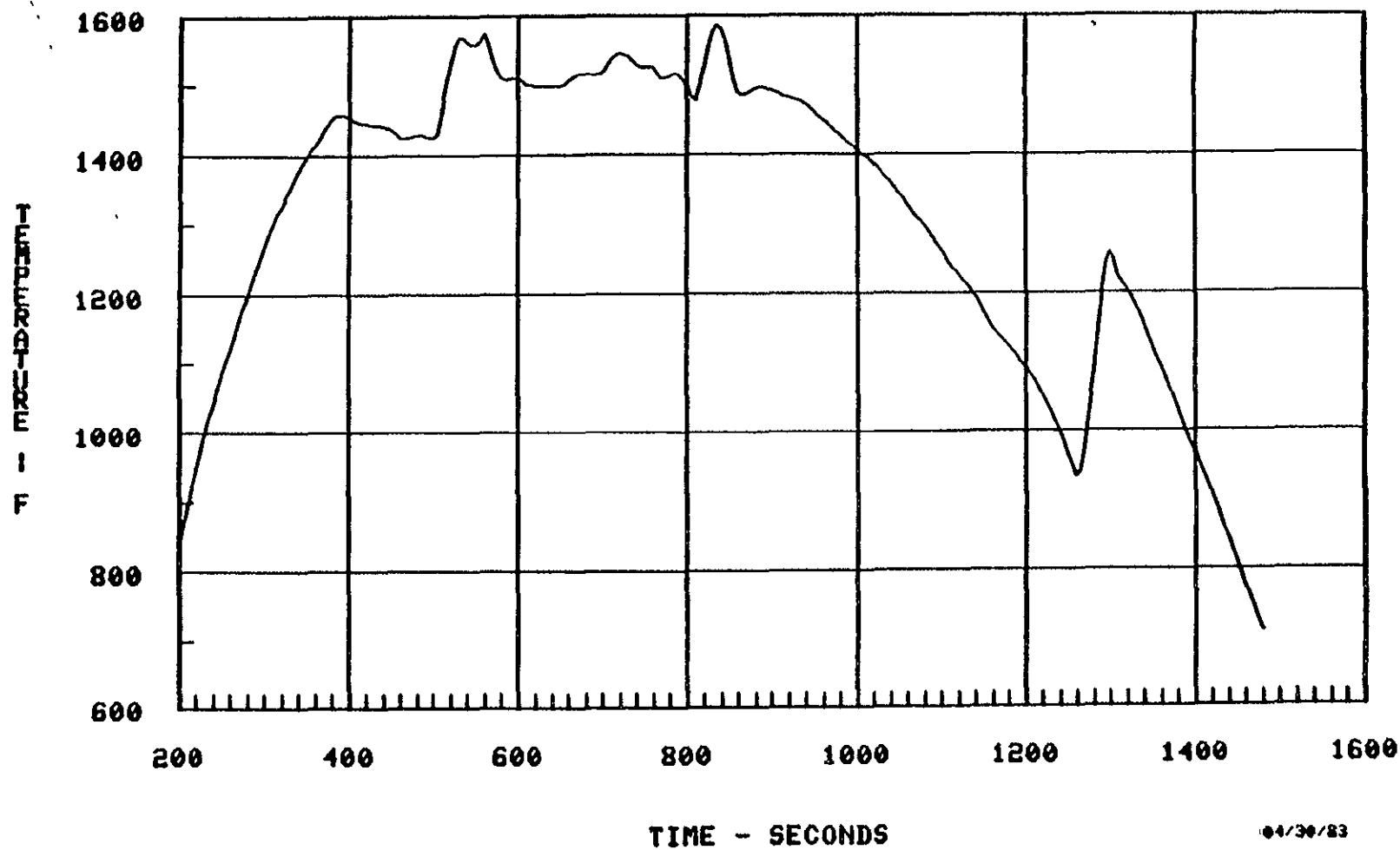
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B-147

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

U09T9381A



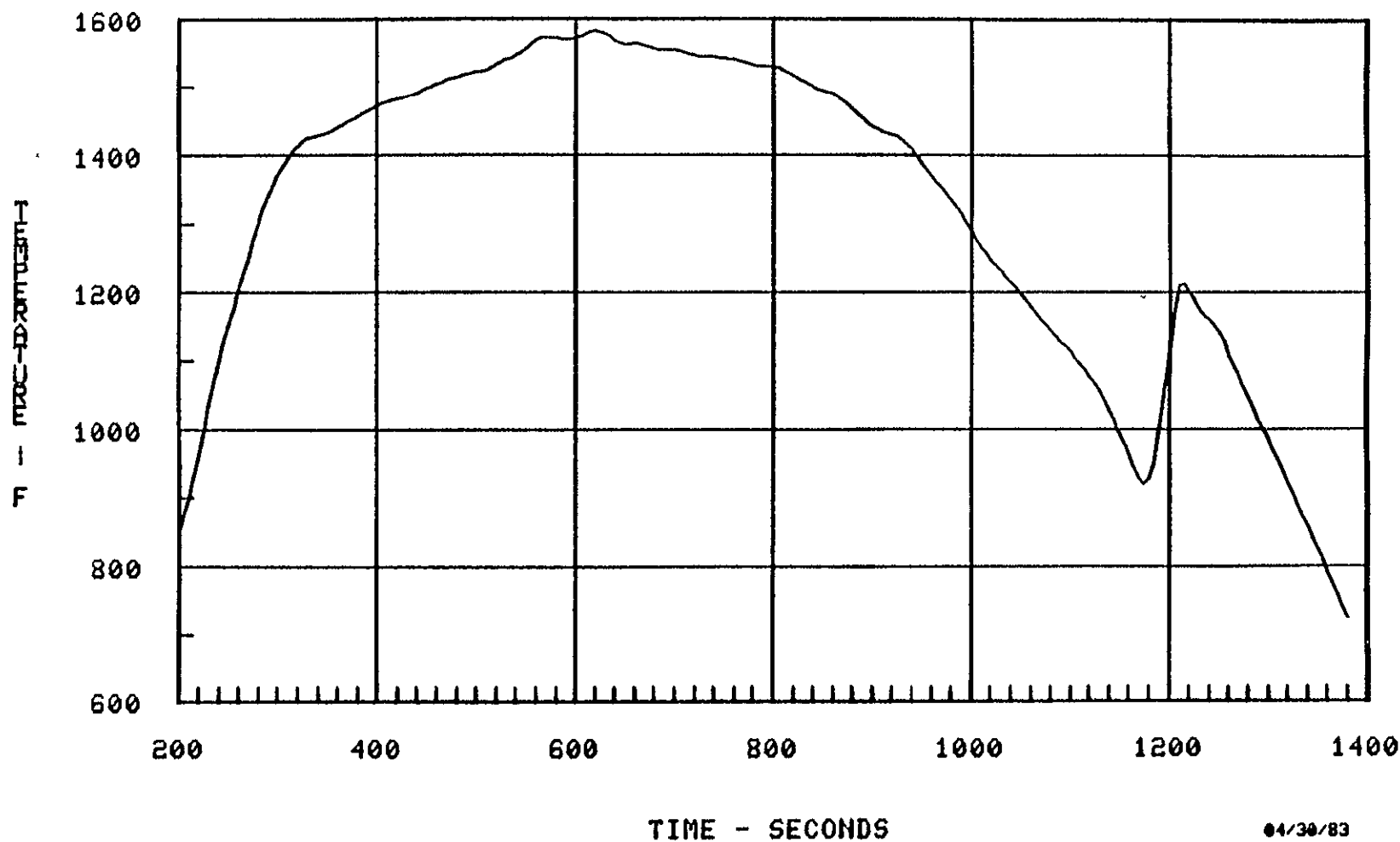
B-142

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04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

U09T9381A



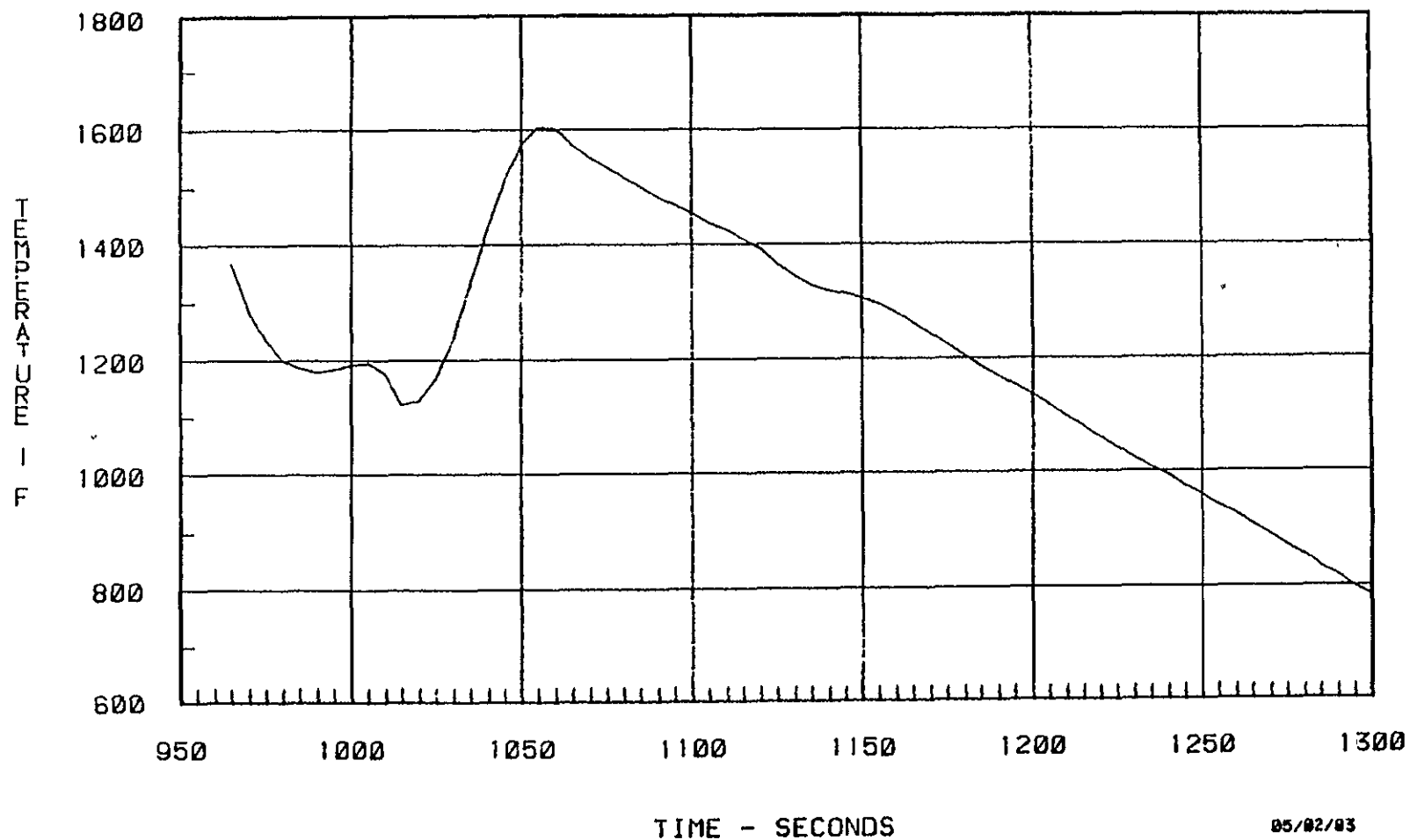
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B-143

04/30/83

# STS-4 (107 FT LENGTH CL $X/L=0.26$ ) FLIGHT PARAMETER COMPARISO

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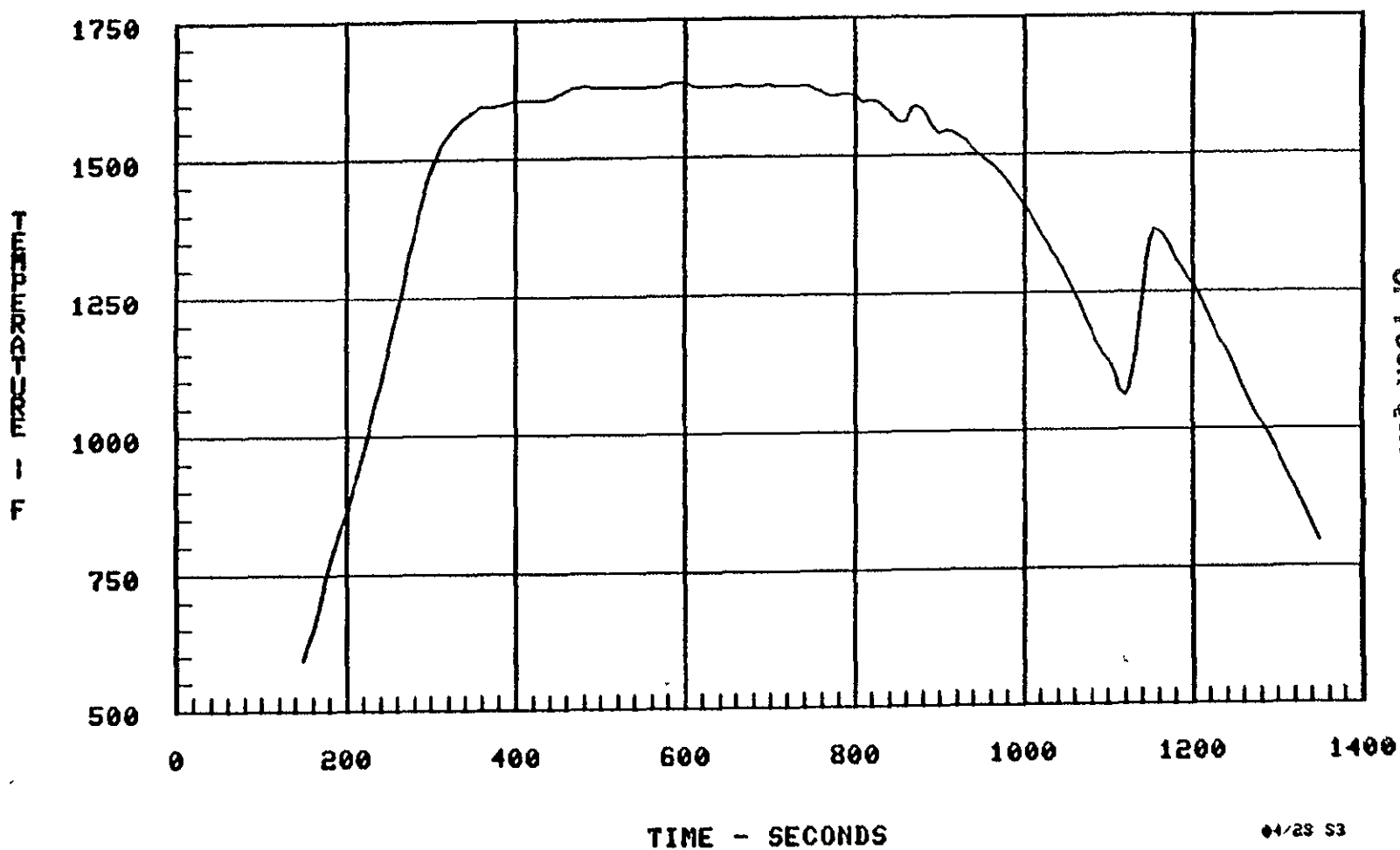
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05/02/83



# STS-5 (107 FT LENGTH CL X/L=0.26) FLIGHT PARAMETER COMPARISO

U09T9381A



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B-145

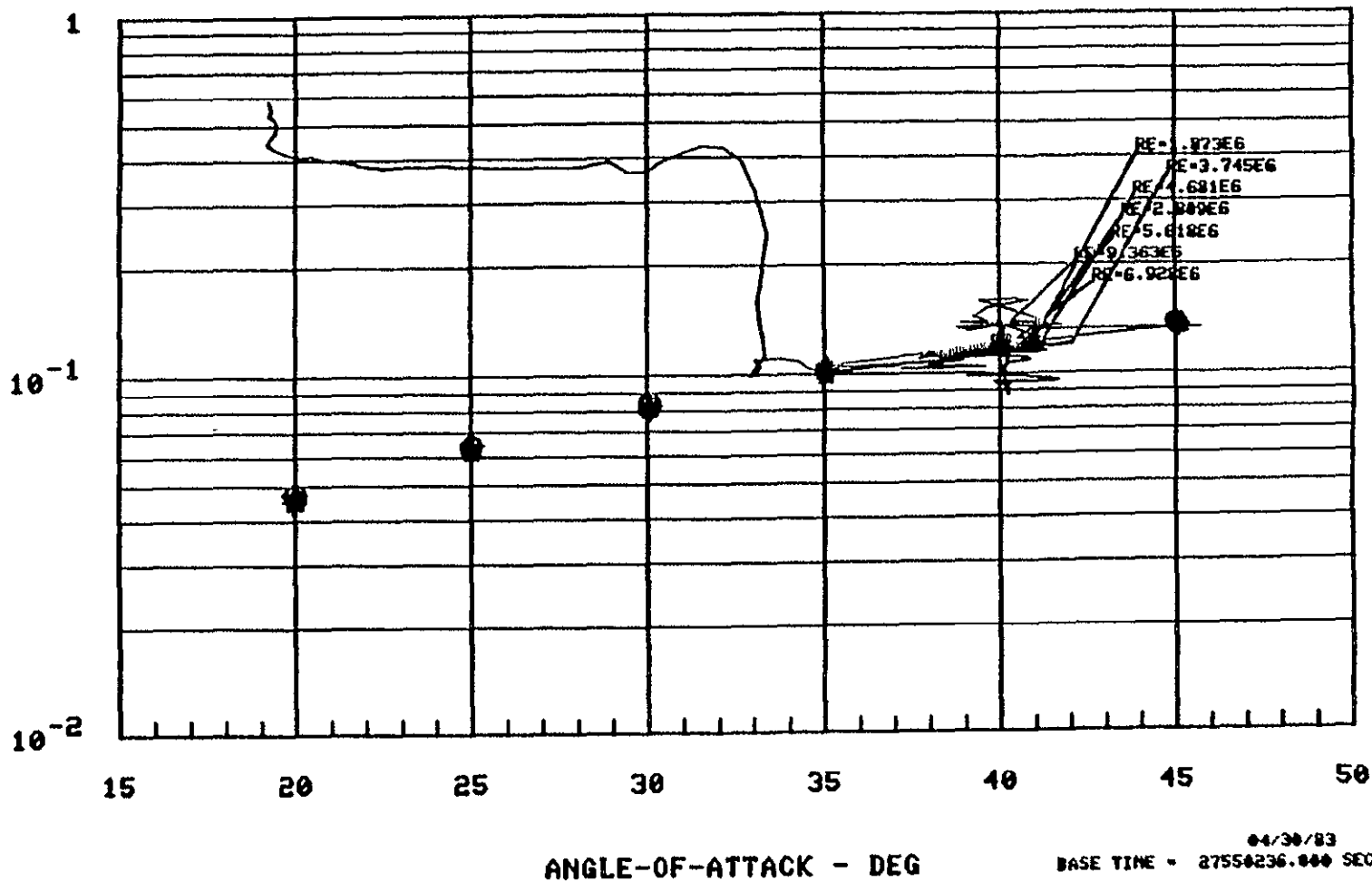
# STS-2 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9421A/H-REF 200-1480 SEC

LINE COUNT - I/I-QUAL



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B-146

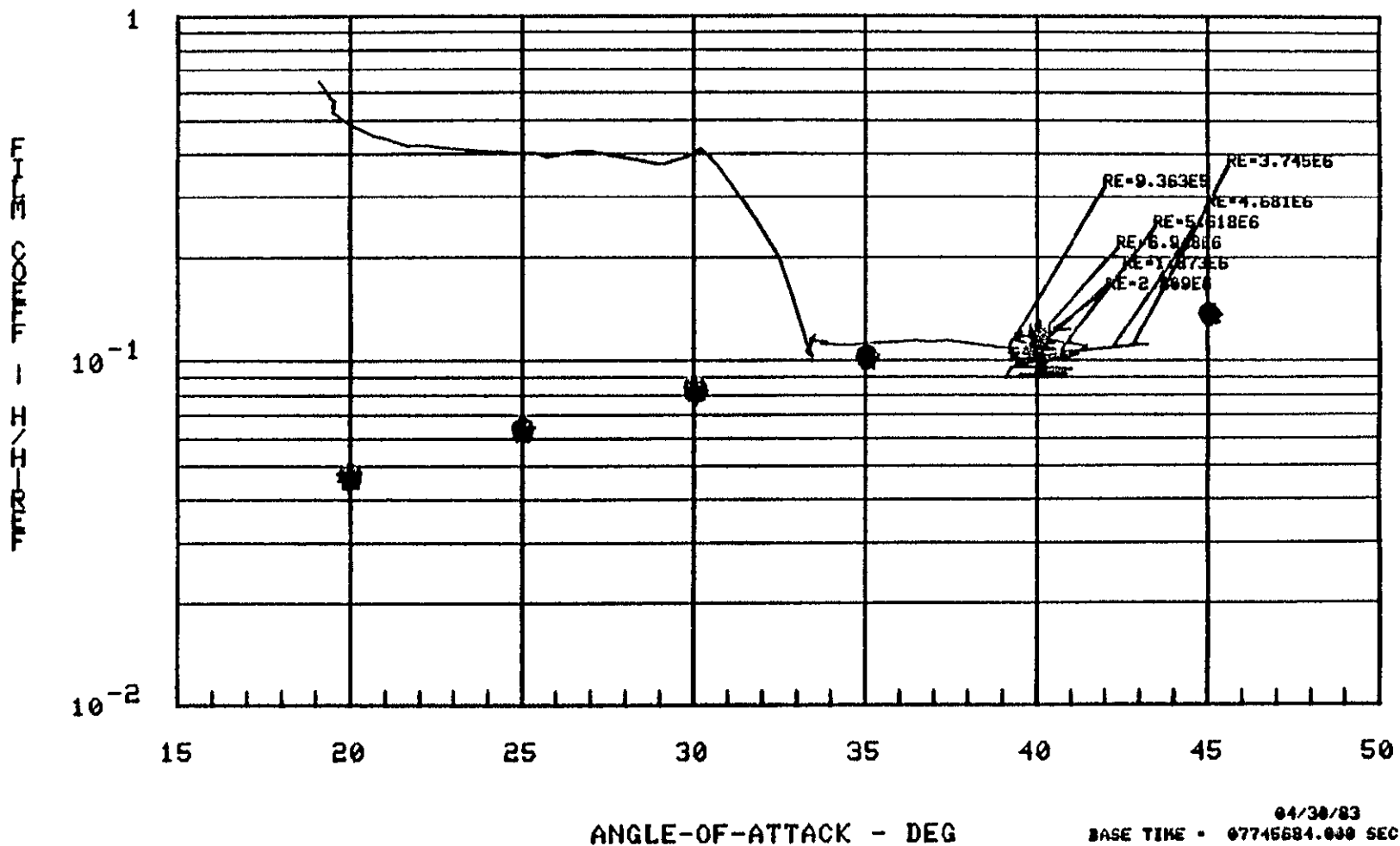
04/30/83  
BASE TIME = 27550236.000 SEC.

# STS-3 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

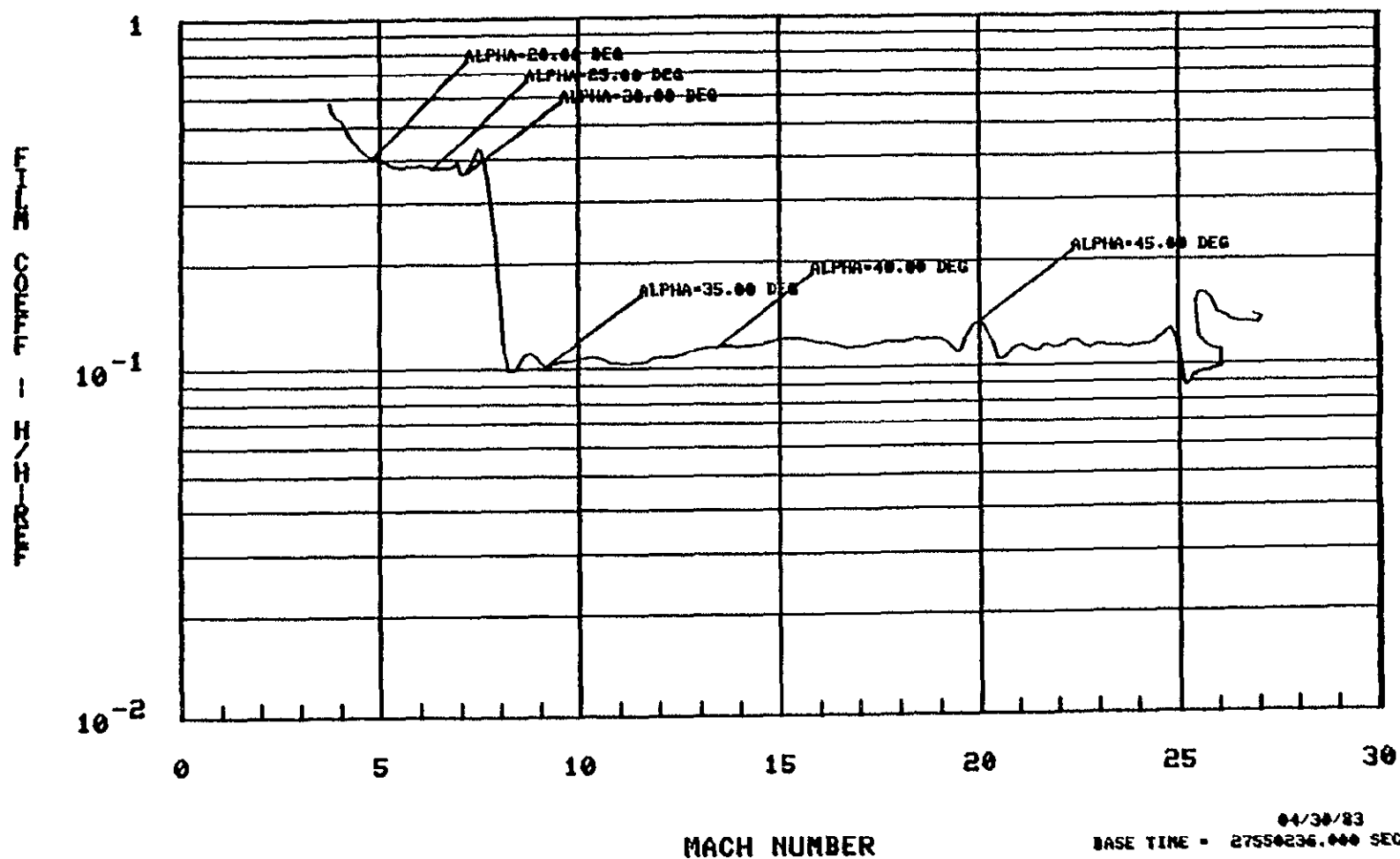
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# STS-2 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISO

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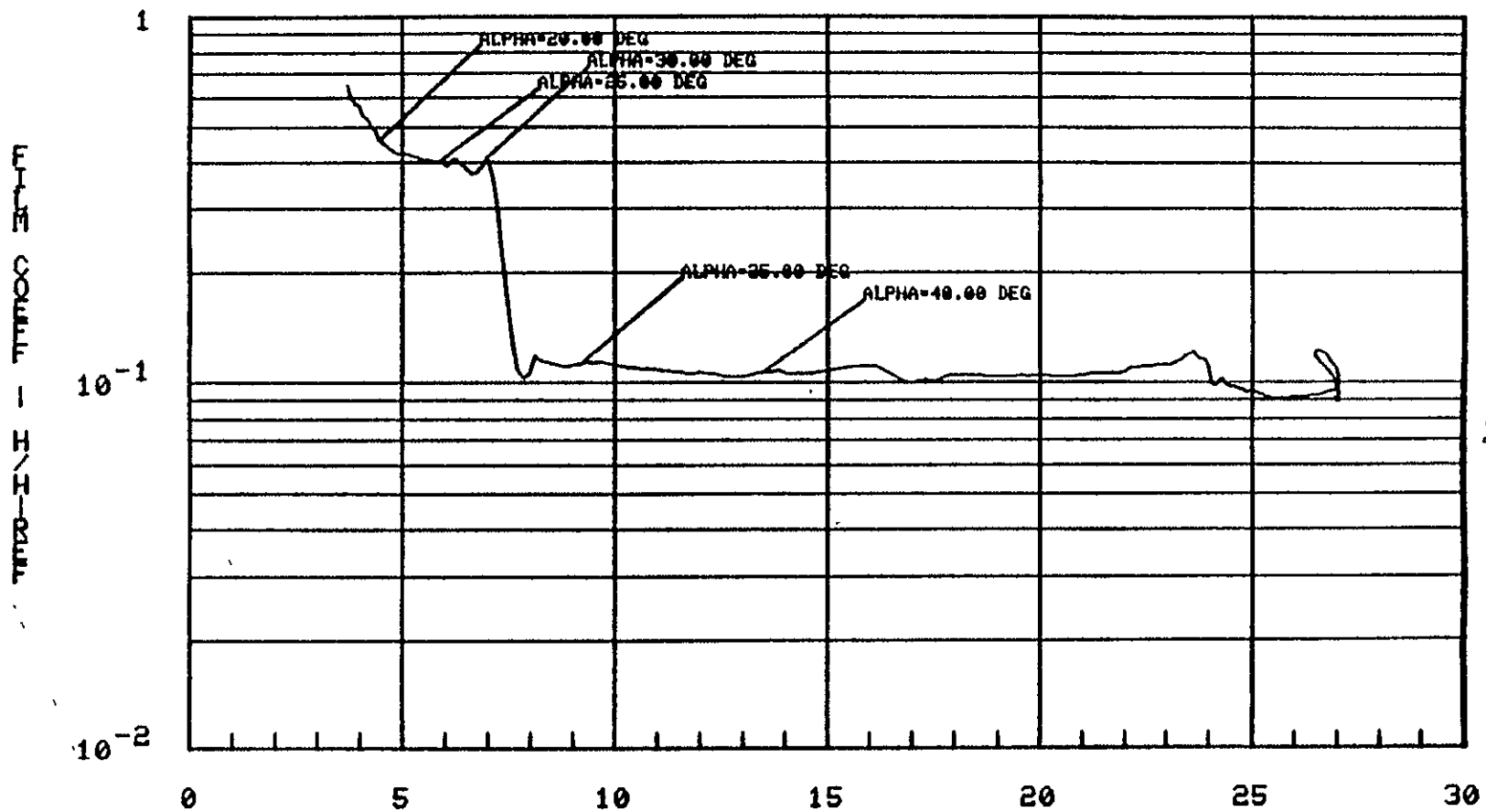


B-148

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# STS-3 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISO

U09T9421A/H-REF 200-1380 SEC



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QUALITY

B-149

MACH NUMBER

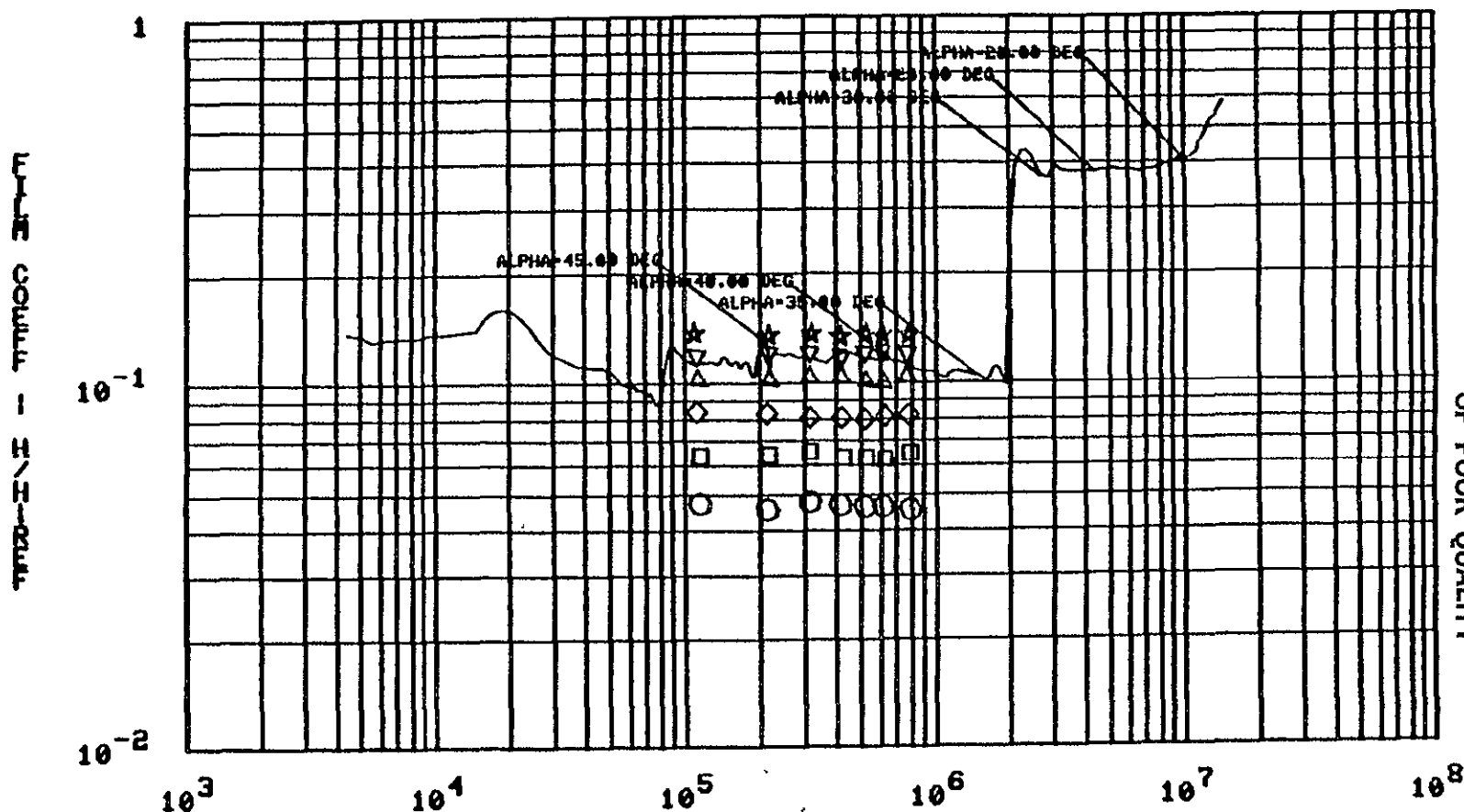
04/30/83  
BASE TIME = 07745684.000 SEC.

# STS-2 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9421A/H-REF 200-1480 SEC



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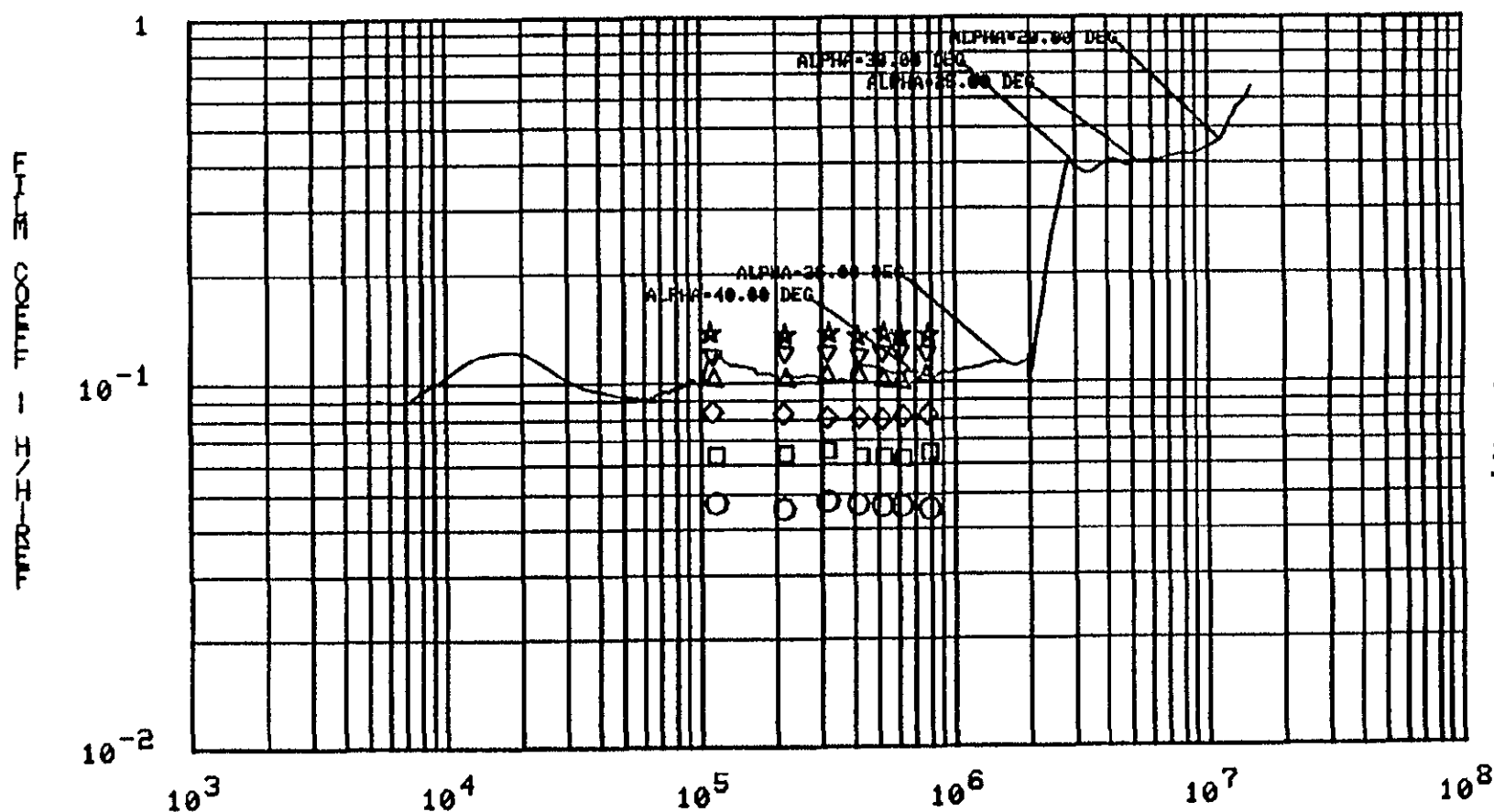
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04/30/83  
BASE TIME = 27550236.000 SEC.

# ST5-3 (107 FT LENGTH CL $X/L=0.29$ ) FLIGHT PARAMETER COMPARISO

○ OH49 ALPHA = 20 DEGREES  
 □ OH49 ALPHA = 25 DEGREES  
 ◇ OH49 ALPHA = 30 DEGREES  
 △ OH49 ALPHA = 35 DEGREES  
 ▼ OH49 ALPHA = 40 DEGREES  
 ★ OH49 ALPHA = 45 DEGREES

U09T9421A/H-REF 200-1380 SEC



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B-151

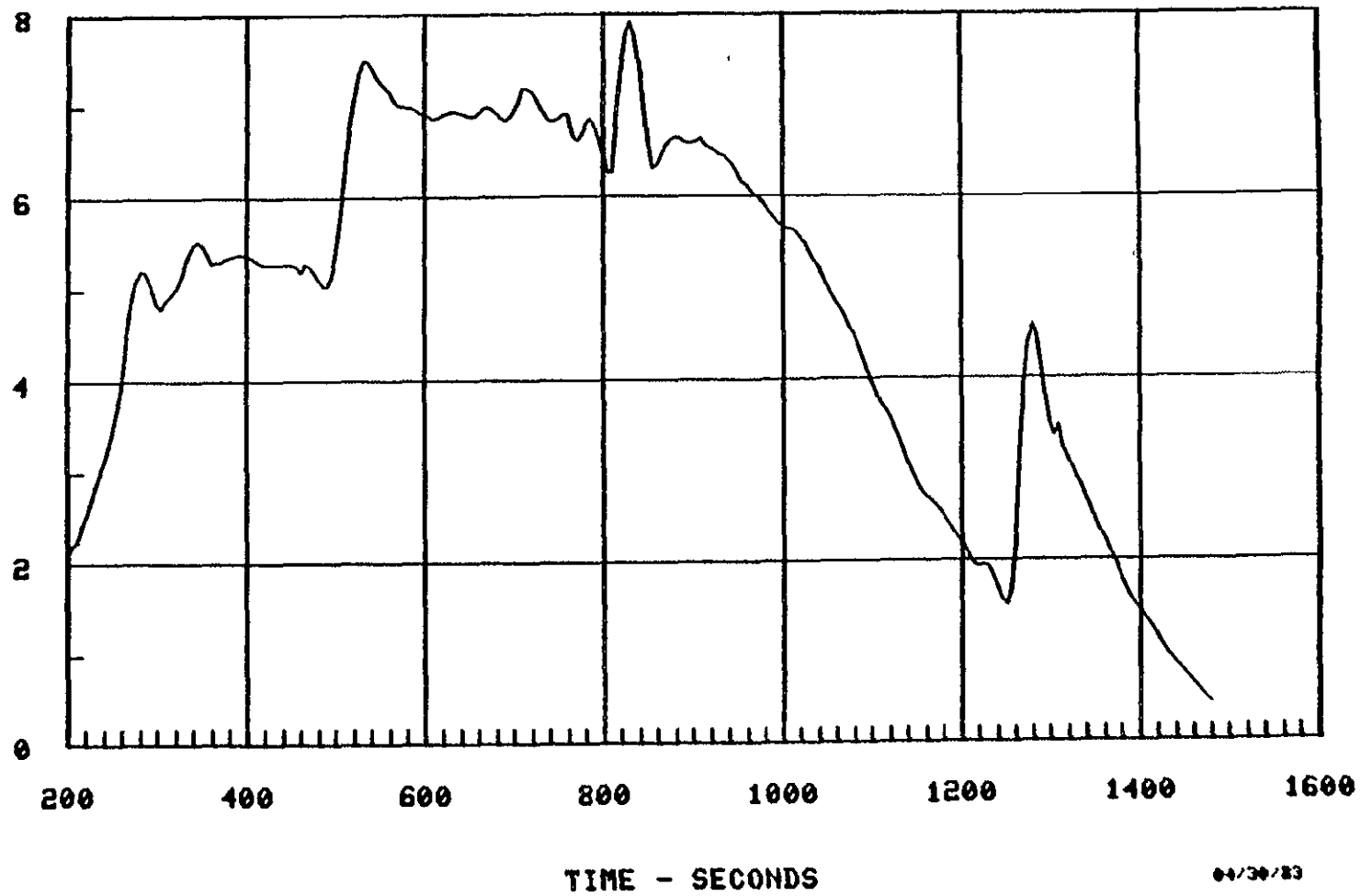
REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME = 07745684.000 SEC.

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INDICATED KEEL - MACHINING - SACS



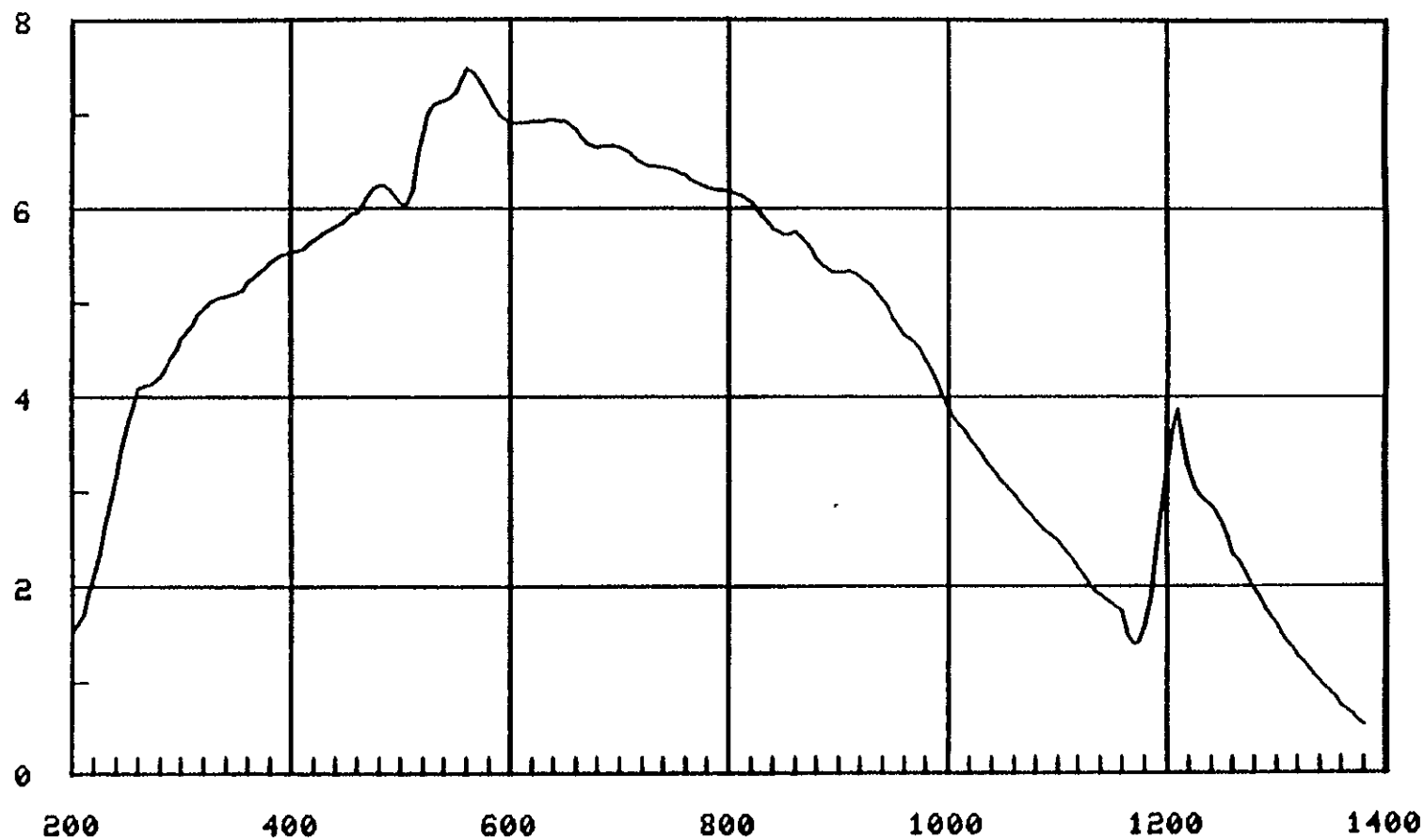
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# STS-3 (107 FT LENGTH CL $X/L=0.29$ ) FLIGHT PARAMETER COMPARISO

U09T9421A

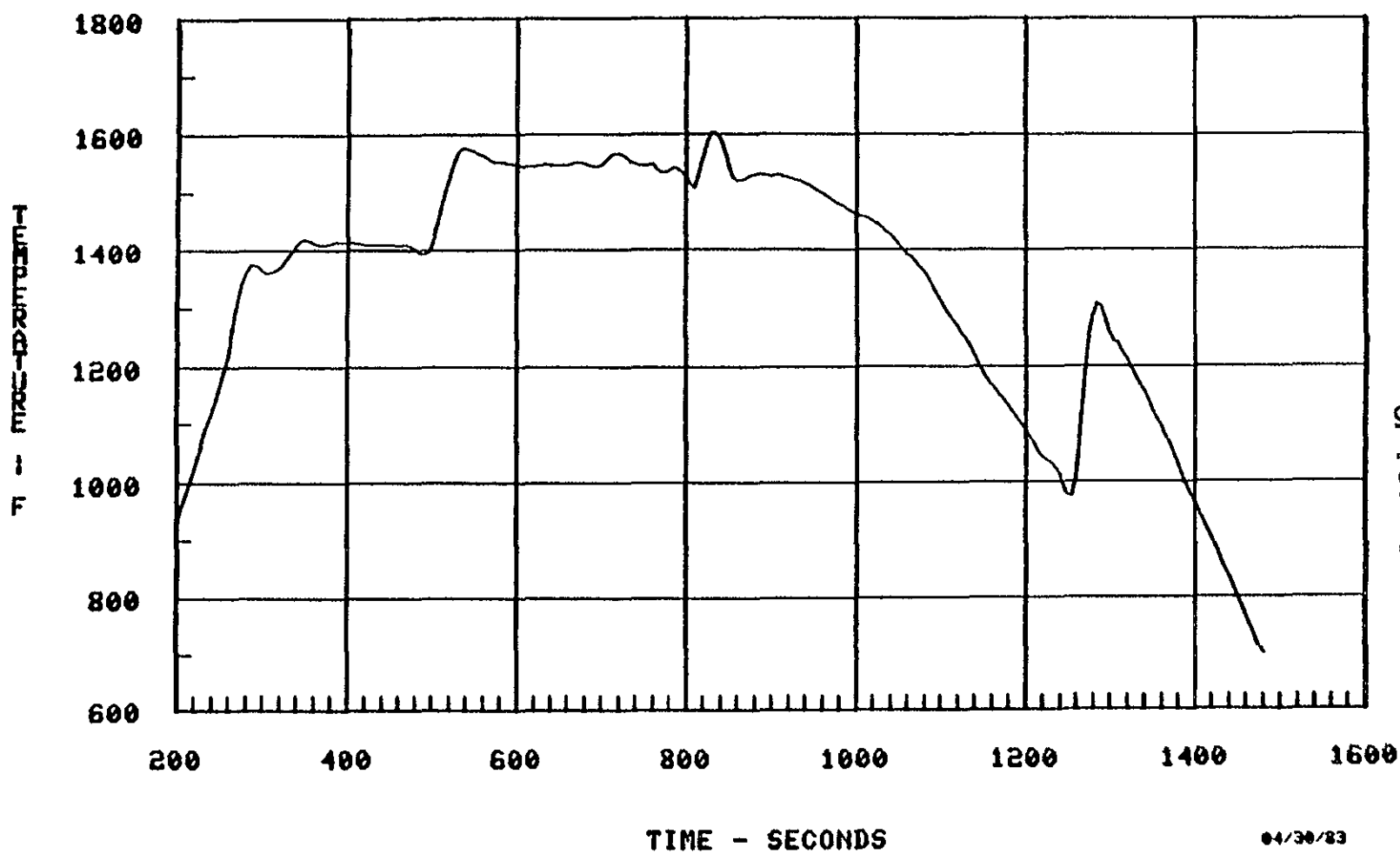
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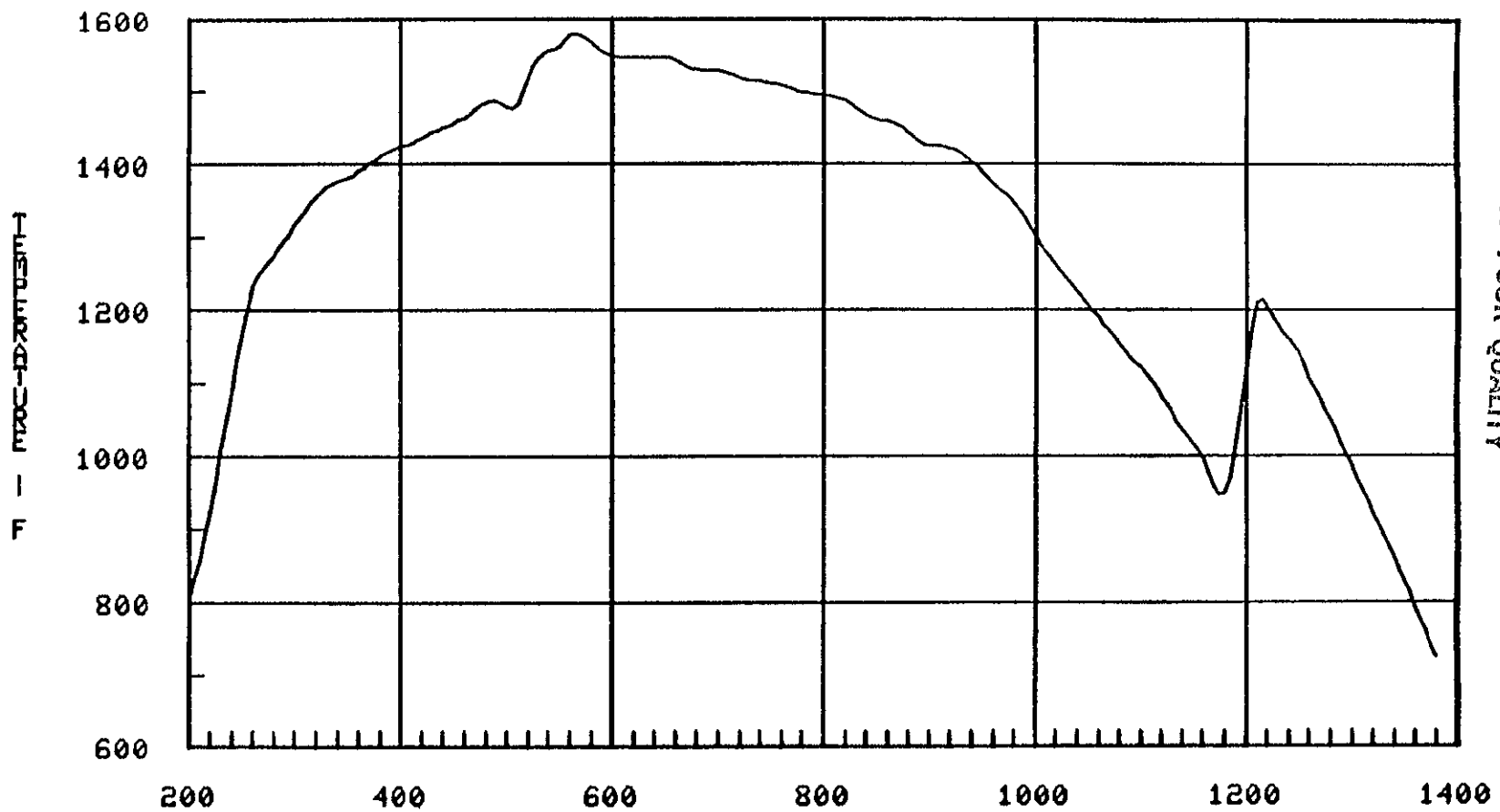
# STS-2 (107 FT LENGTH CL X/L=0.29) FLIGHT PARAMETER COMPARISON

U09T9421A



ST5-3 (107 FT LENGTH CL  $X/L=0.29$ ) FLIGHT PARAMETER COMPARISO

————— U09T9421A



B-155

TIME - SECONDS

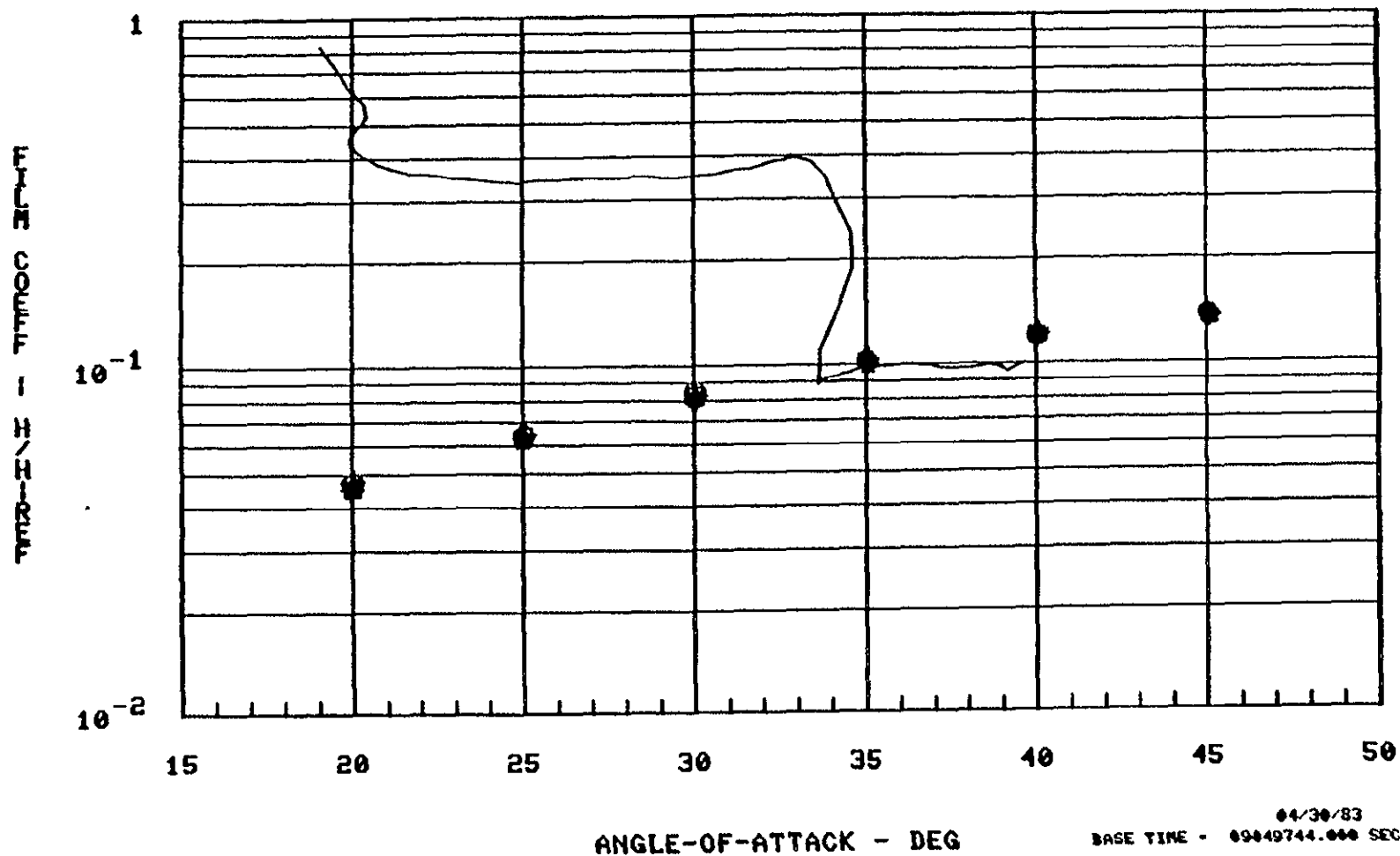
04/30/83

# STS-1 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9468A/H-REF 1065-1460 SEC



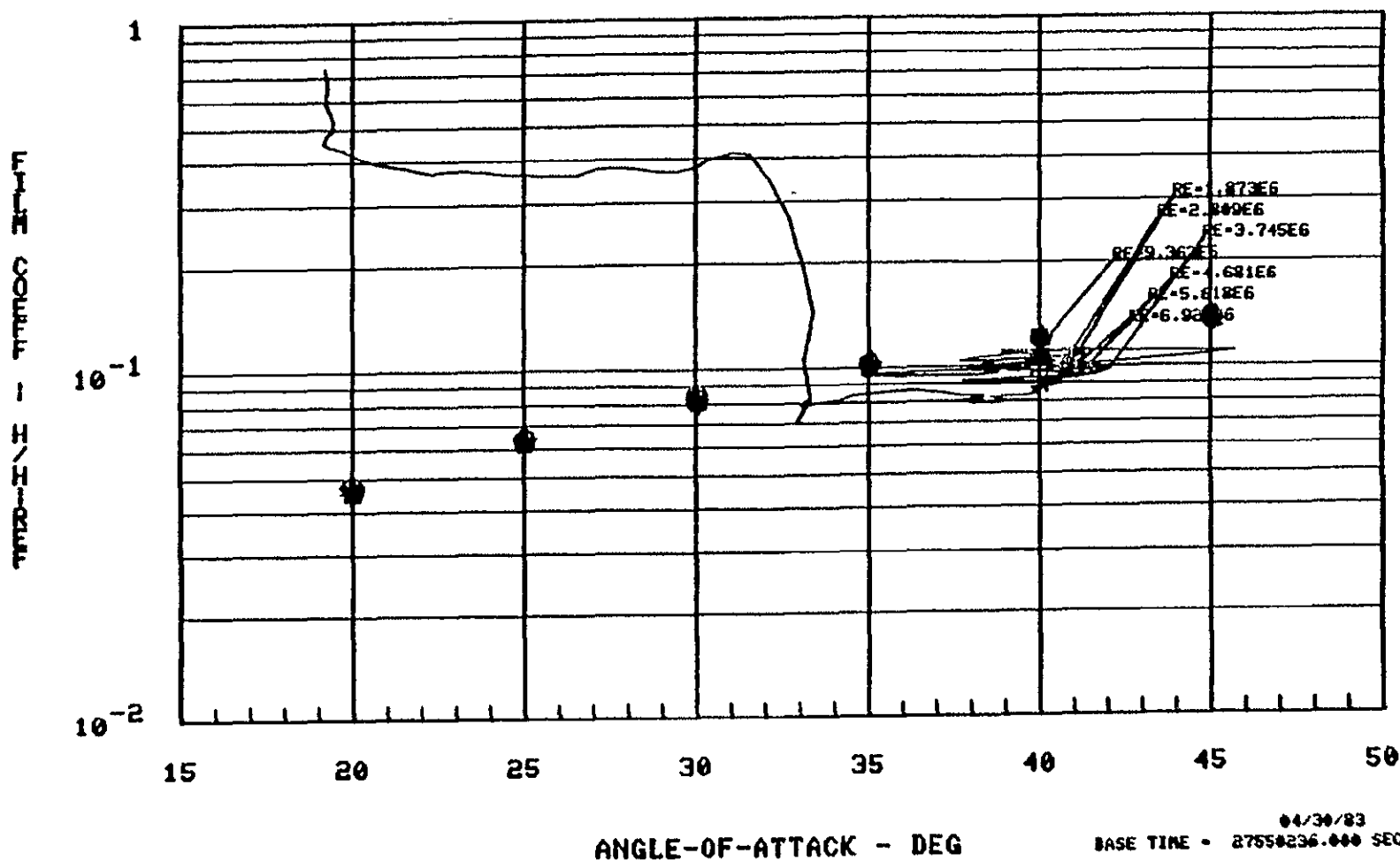
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OF POOR QUALITY

# STS-2 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9468A/H-REF 200-1480 SEC



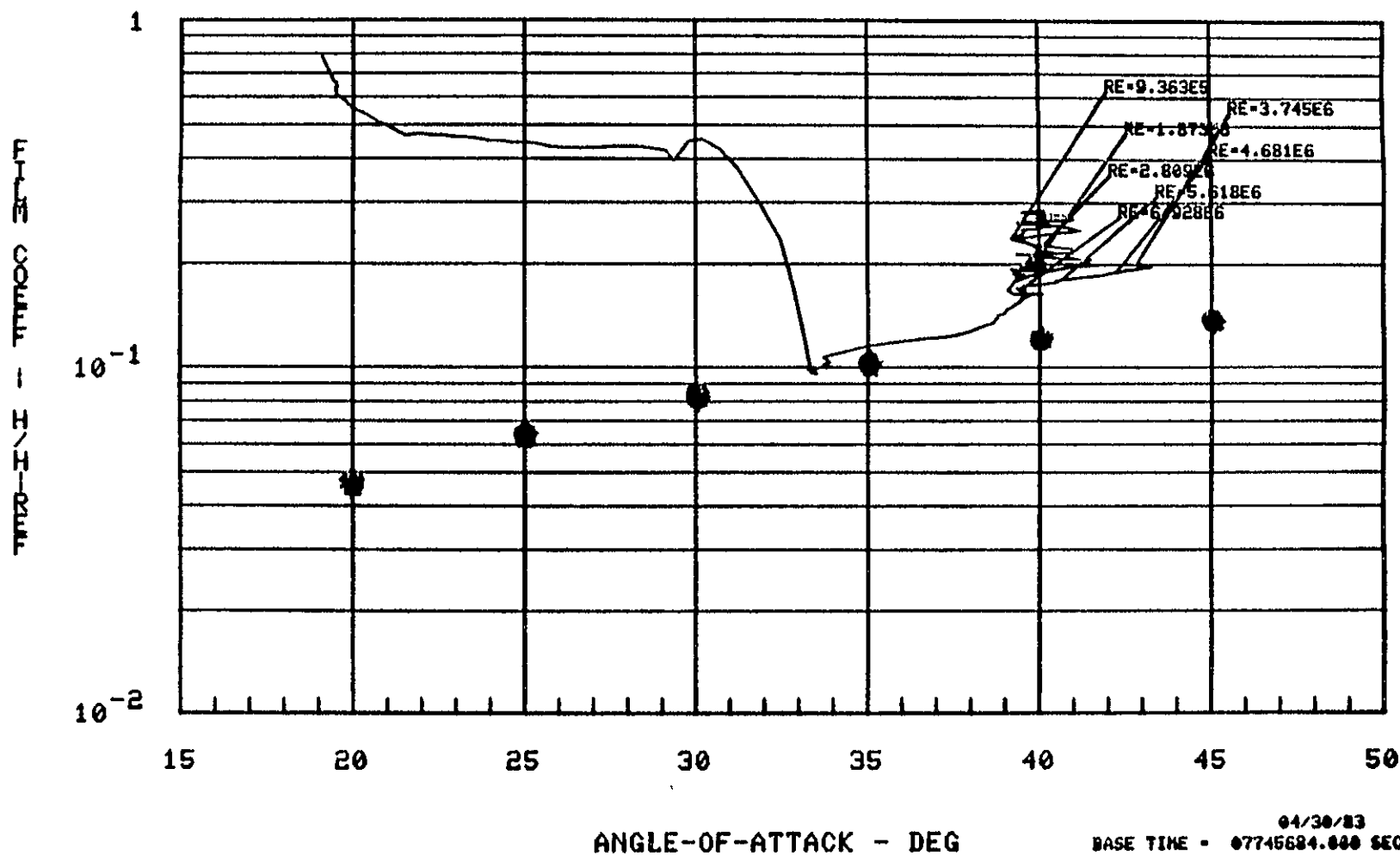
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OF POOR QUALITY

# STS-3 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U07T9468A/H-REF 200-1380 SEC



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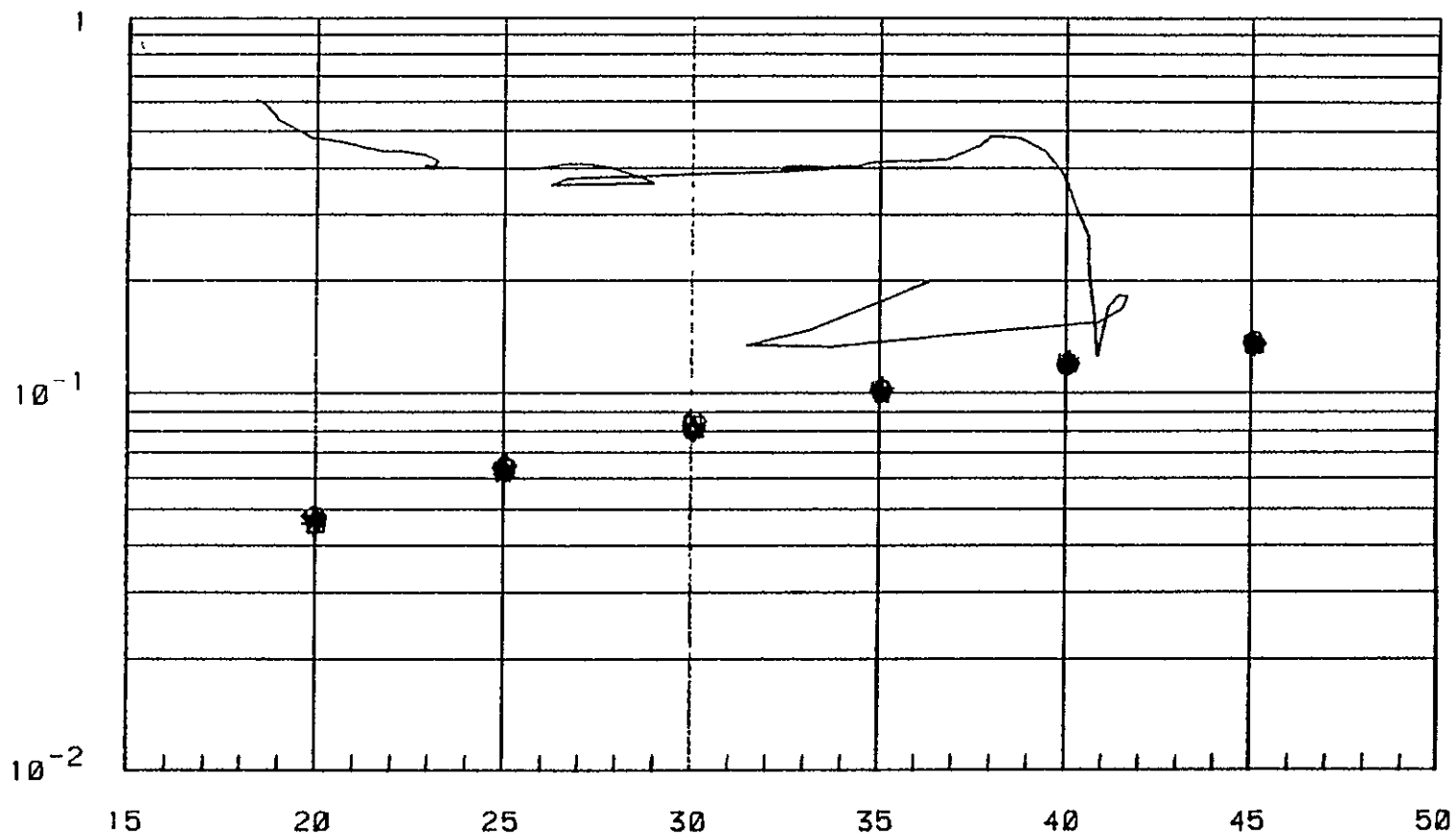
# STS-4 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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DH49 0 0175 SCALE RE = 0.5 E06  
 DH49 0 0175 SCALE RE = 1.0 E06  
 DH49 0 0175 SCALE RE = 1.5 E06  
 DH49 0 0175 SCALE RE = 2.0 E06  
 DH49 0 0175 SCALE RE = 2.5 E06  
 DH49 0 0175 SCALE RE = 3.0 E06  
 DH49 0 0175 SCALE RE = 3.7 E06

V07T0460A/H-REF 065-1300 SEC

FLIGHT COEFF - INT-REF



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B-159

ANGLE-OF-ATTACK - DEG

05/02/83  
 BASE TIME = 16040423.000 SEC.

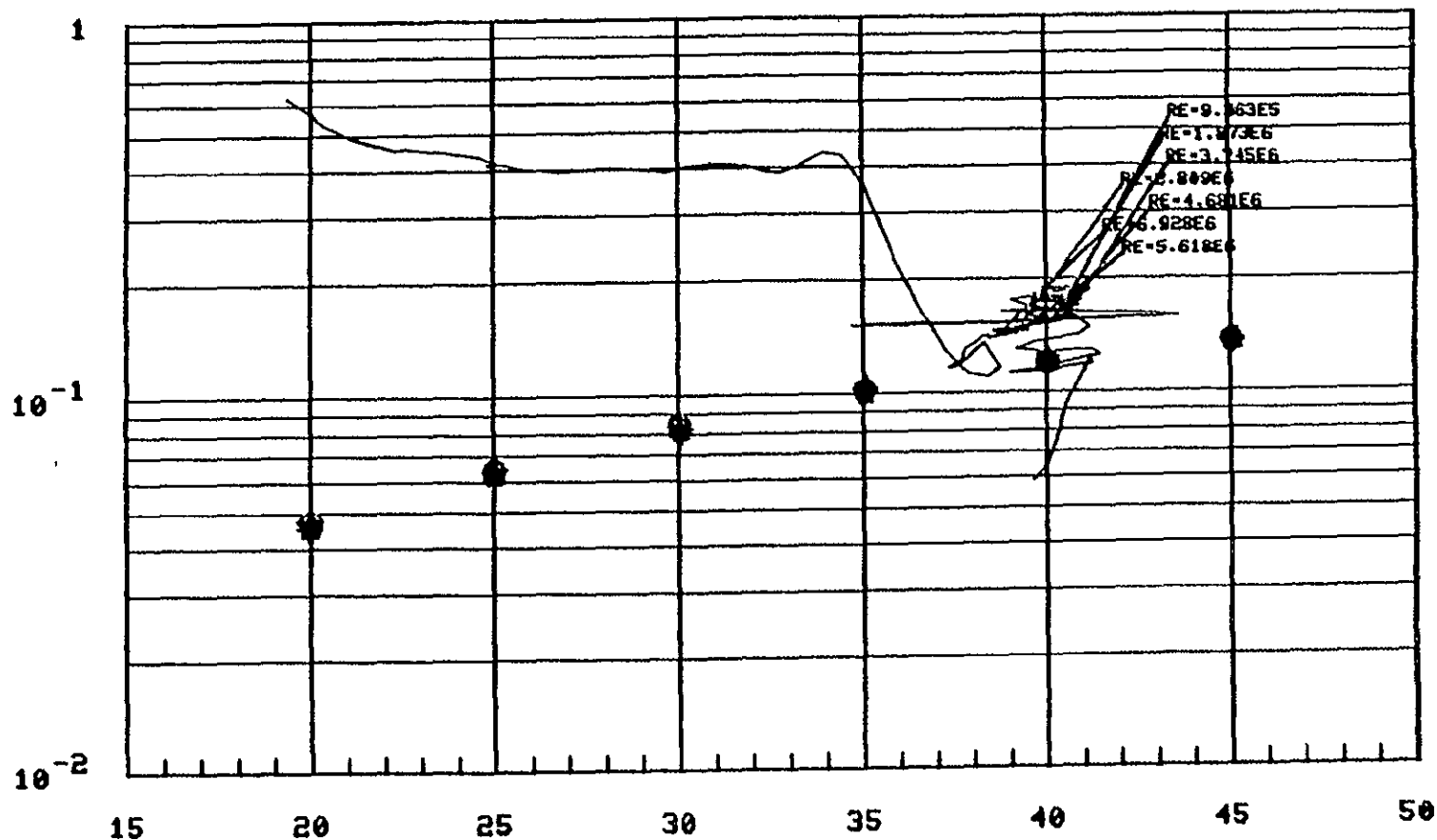
# STS-5 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9468A/H-REF 150-1350 SEC

WAVE COUNT - H/E-0144



ANGLE-OF-ATTACK - DEG

04/28/83  
BASE TIME = 27690591.000 SEC.

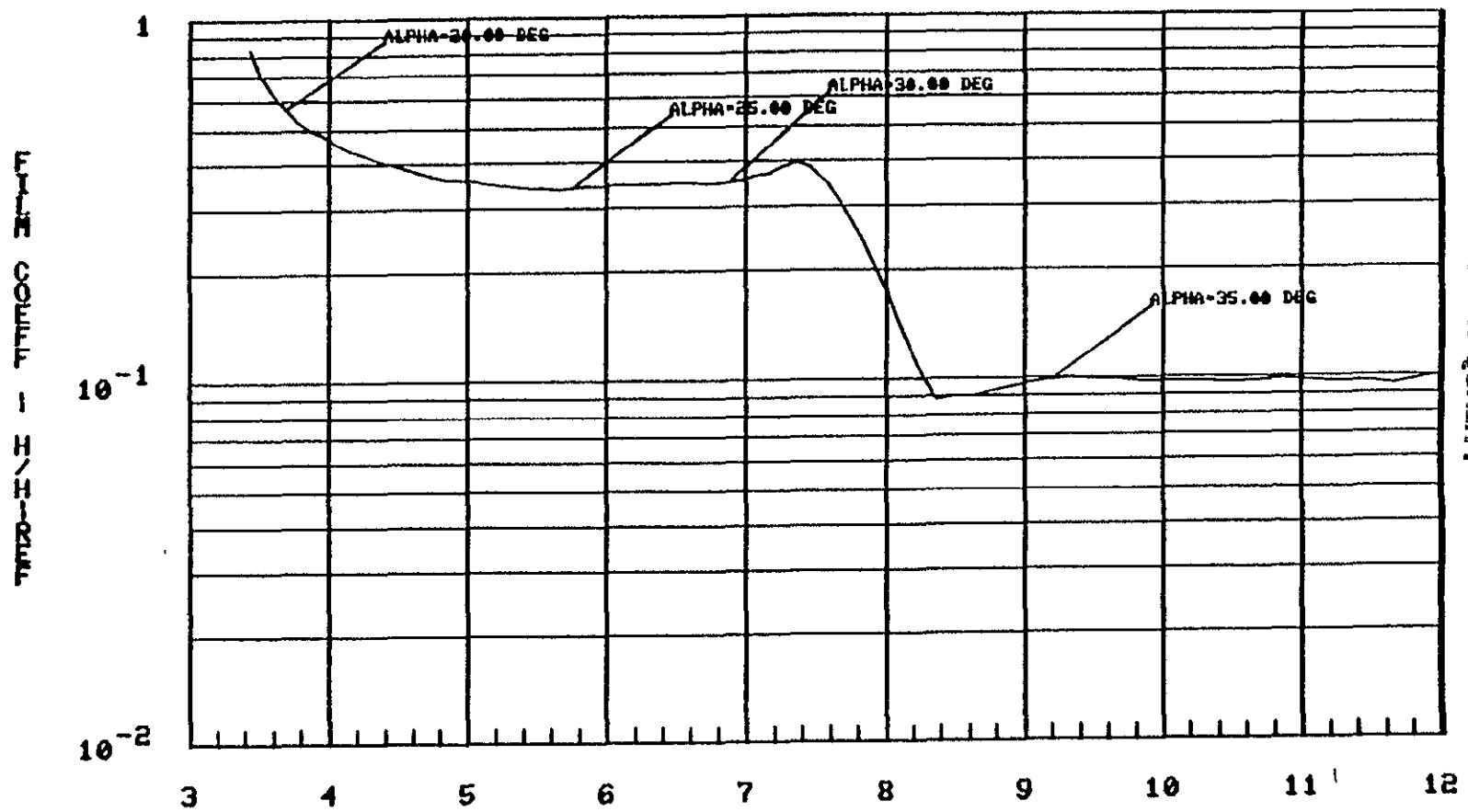
B-160

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# STS-1 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

U07T9468A/H-REF 1065-1460 SEC



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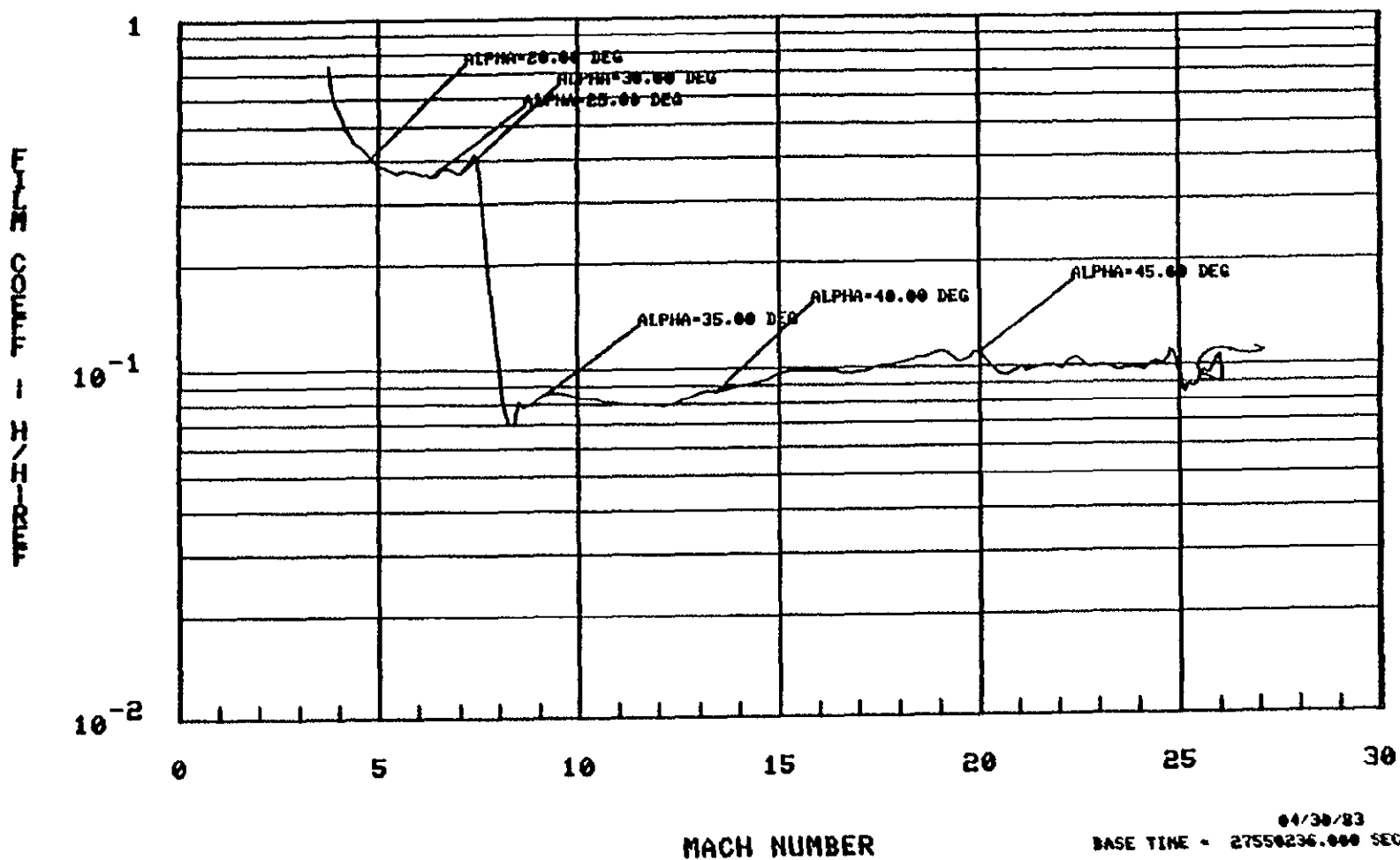
B-161

MACH NUMBER

04/30/83  
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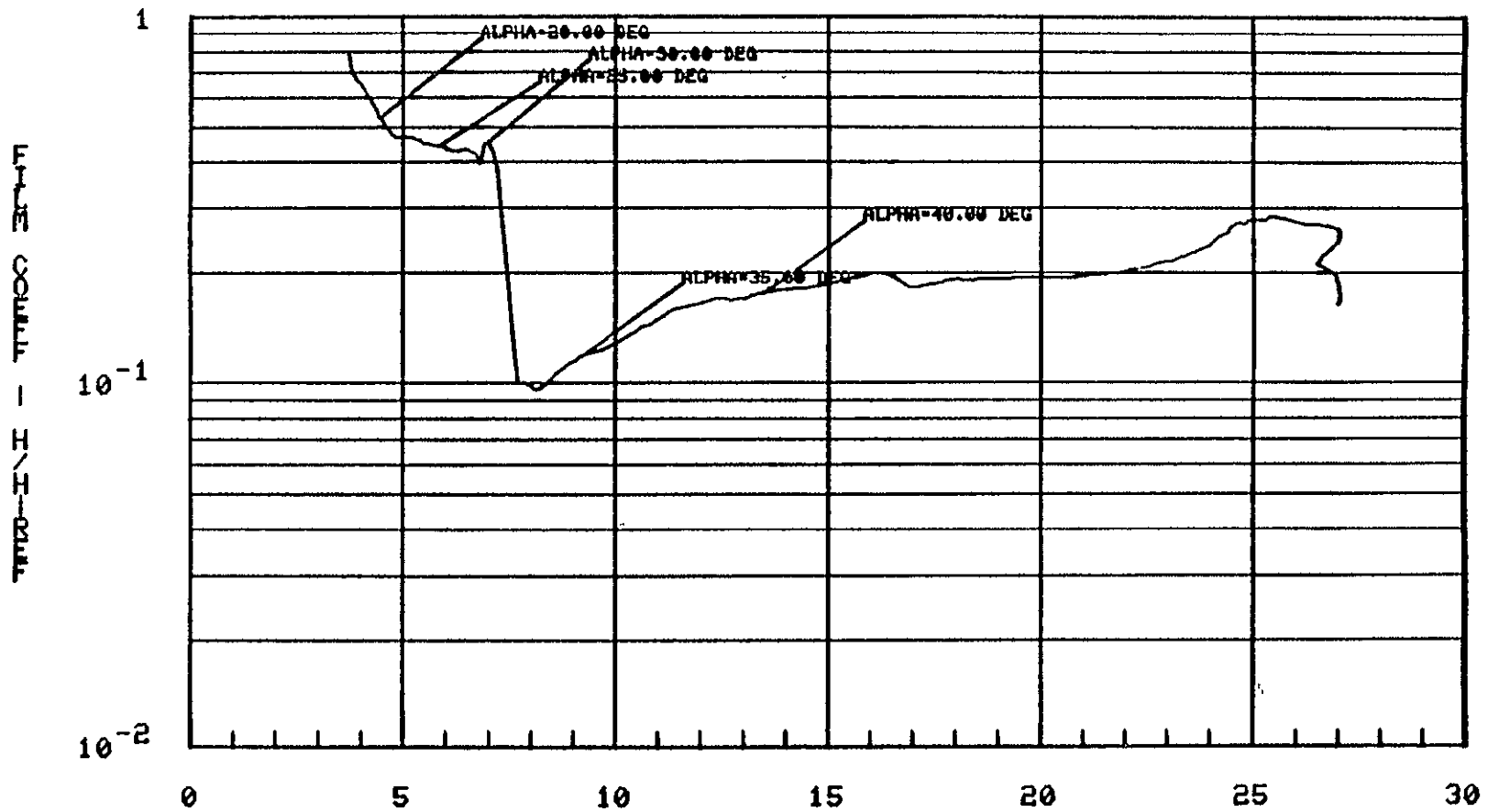
U07T9468A/H-REF 200-1480 SEC



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# STS-3 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

U07T9468A/H-REF 200-1380 SEC



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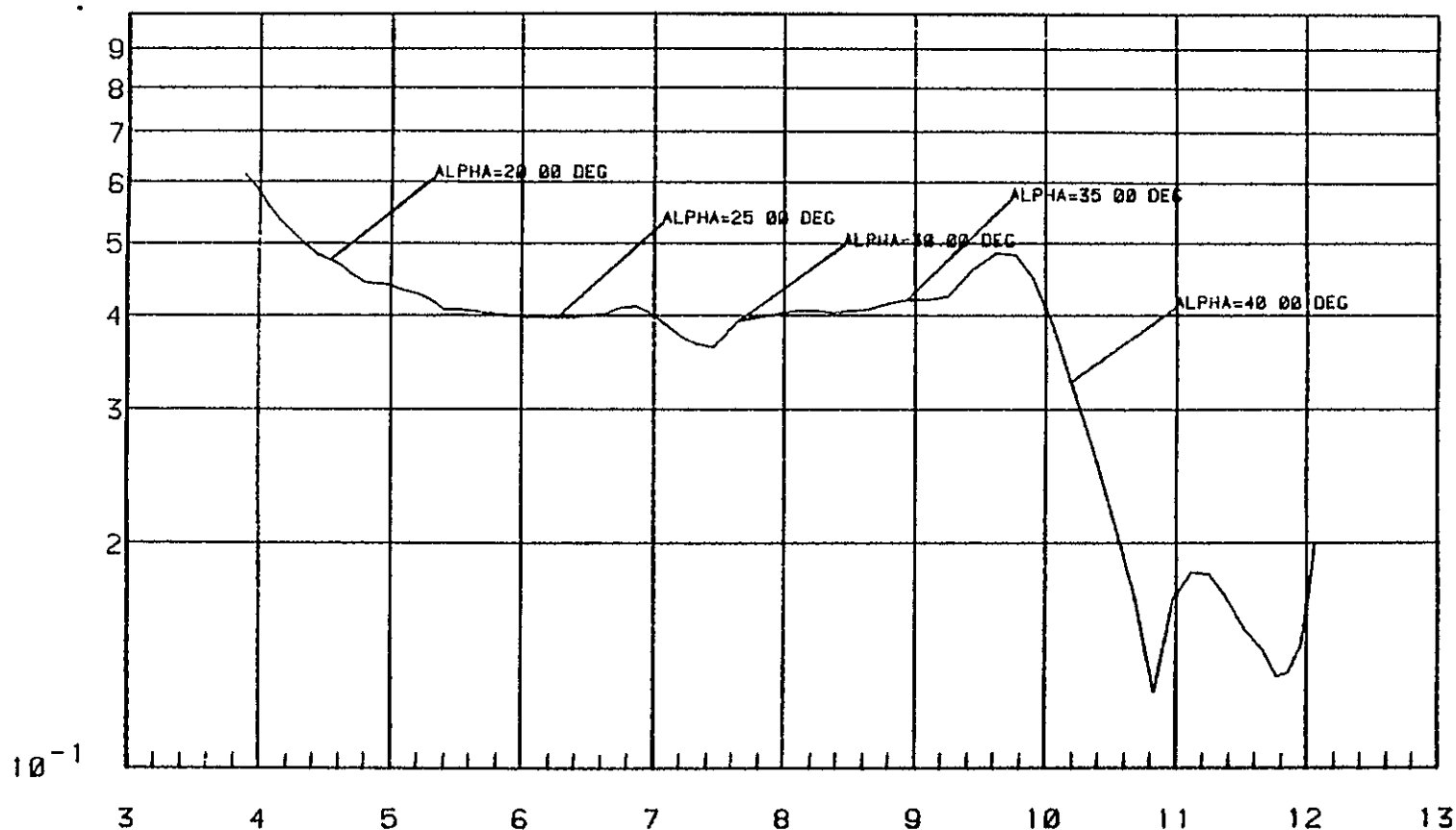
B-163

MACH NUMBER

04/30/83  
BASE TIME = 07745684.000 SEC.

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———— V07T0468A/H-REF 065-1300 SEC



B-164

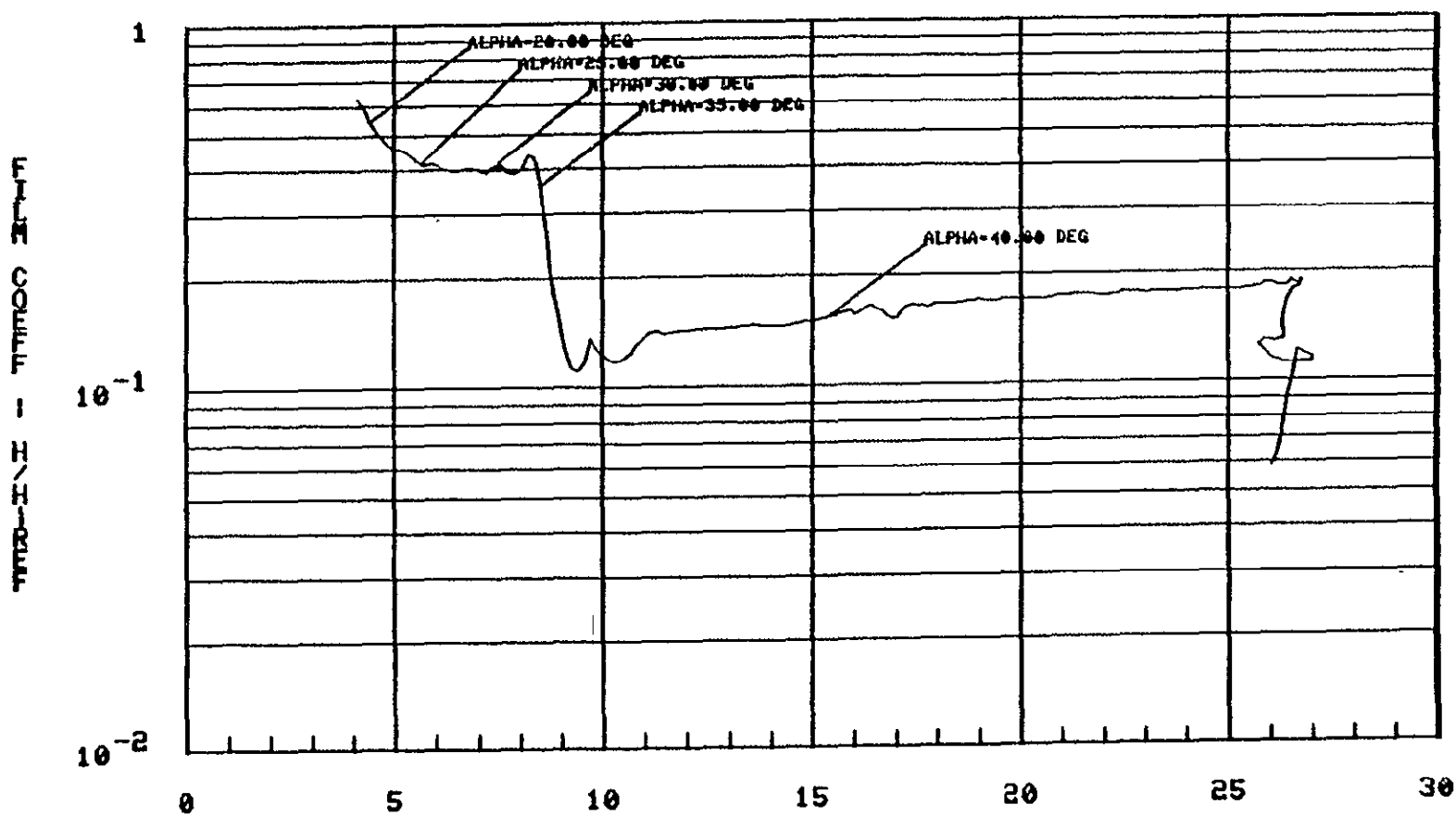
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MACH NUMBER

05/02/83  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISON

U07T9468A/H-REF 150-1350 SEC



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B-165

MACH NUMBER

04/28/83  
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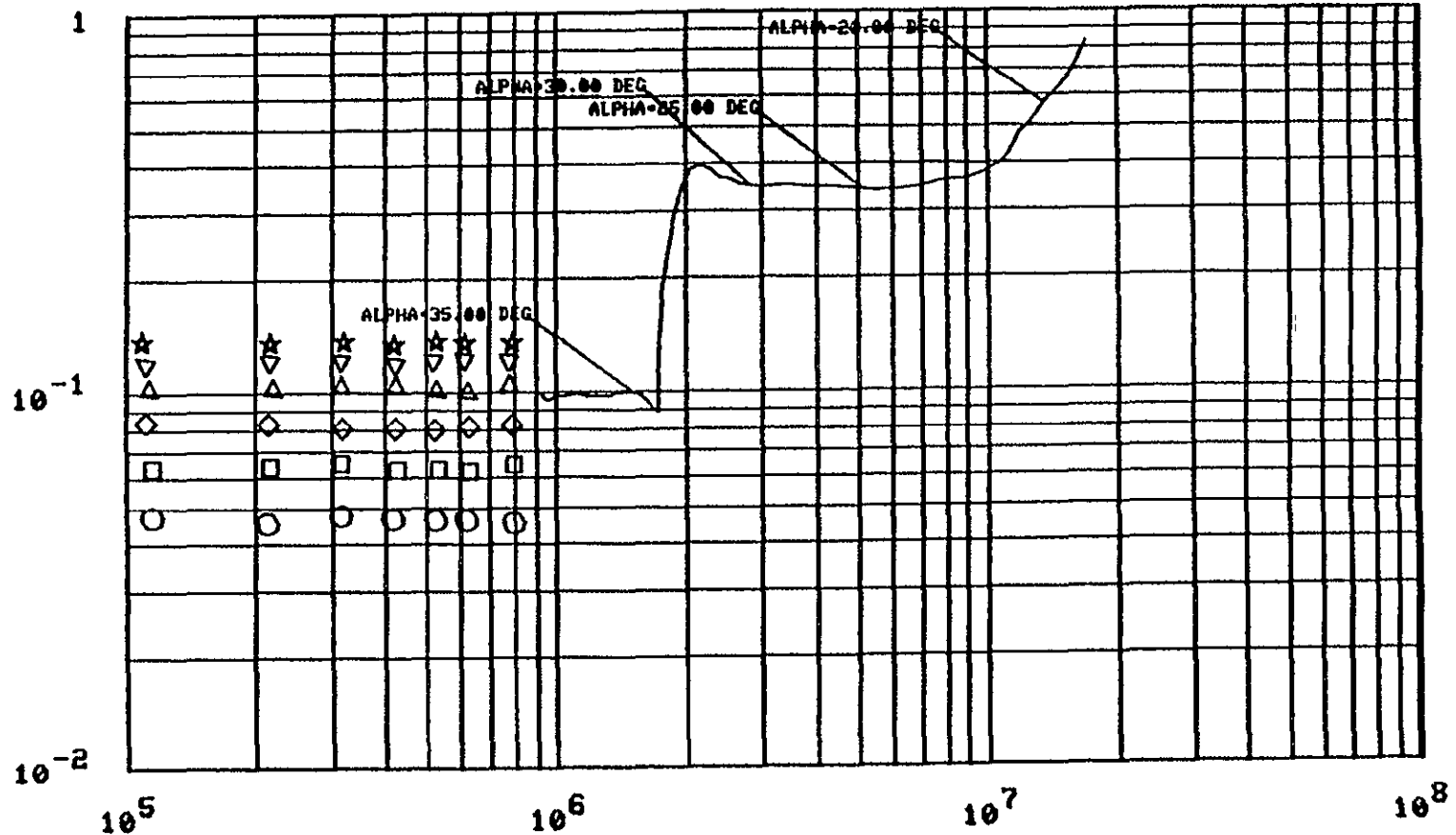
# STS-1 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9468A/H-REF 1065-1460 SEC

WAKE COEFF -  $C_{w, \text{wake}}$



REYNOLDS NUMBER (NS)

04/30/83  
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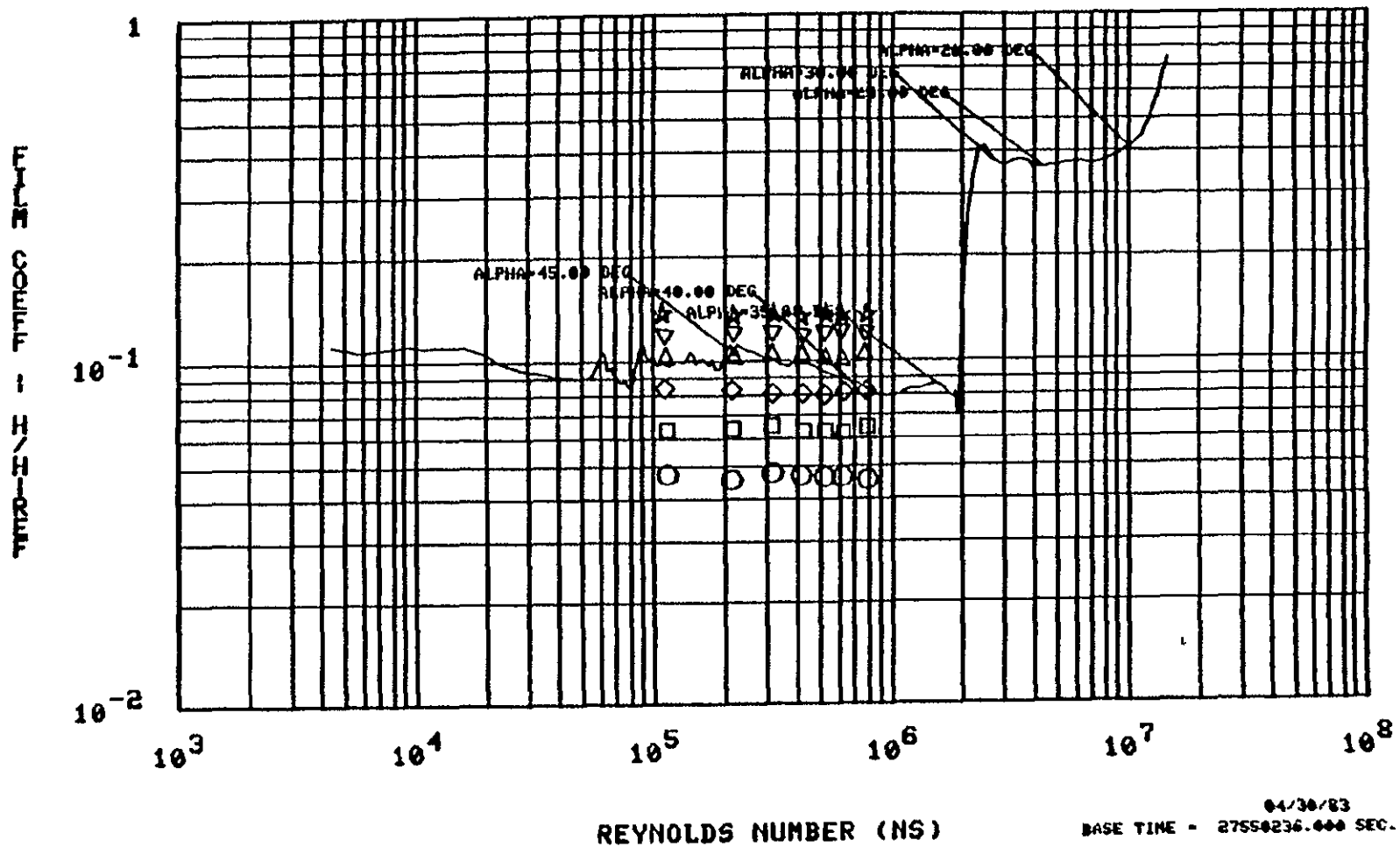
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# STS-2 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

○  
◇  
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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9468A/H-REF 200-1480 SEC



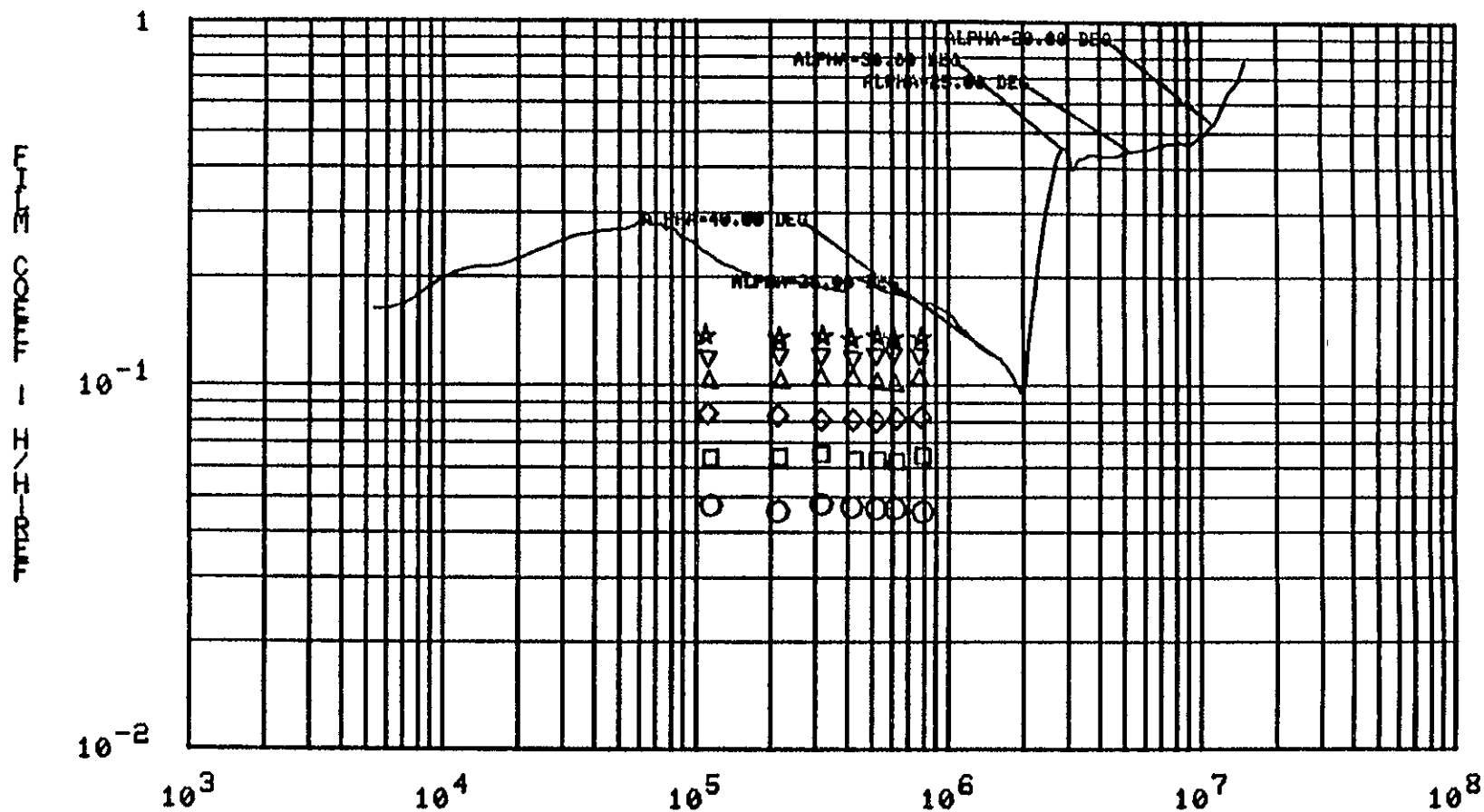
B-167

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# STS-3 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISON

- OH49 ALPHA = 20 DEGREES
- OH49 ALPHA = 25 DEGREES
- ◇ OH49 ALPHA = 30 DEGREES
- △ OH49 ALPHA = 35 DEGREES
- ▽ OH49 ALPHA = 40 DEGREES
- ★ OH49 ALPHA = 45 DEGREES

————— U07T9468A/H-REF 200-1380 SEC



REYNOLDS NUMBER (NS)

04/30/83  
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B-168

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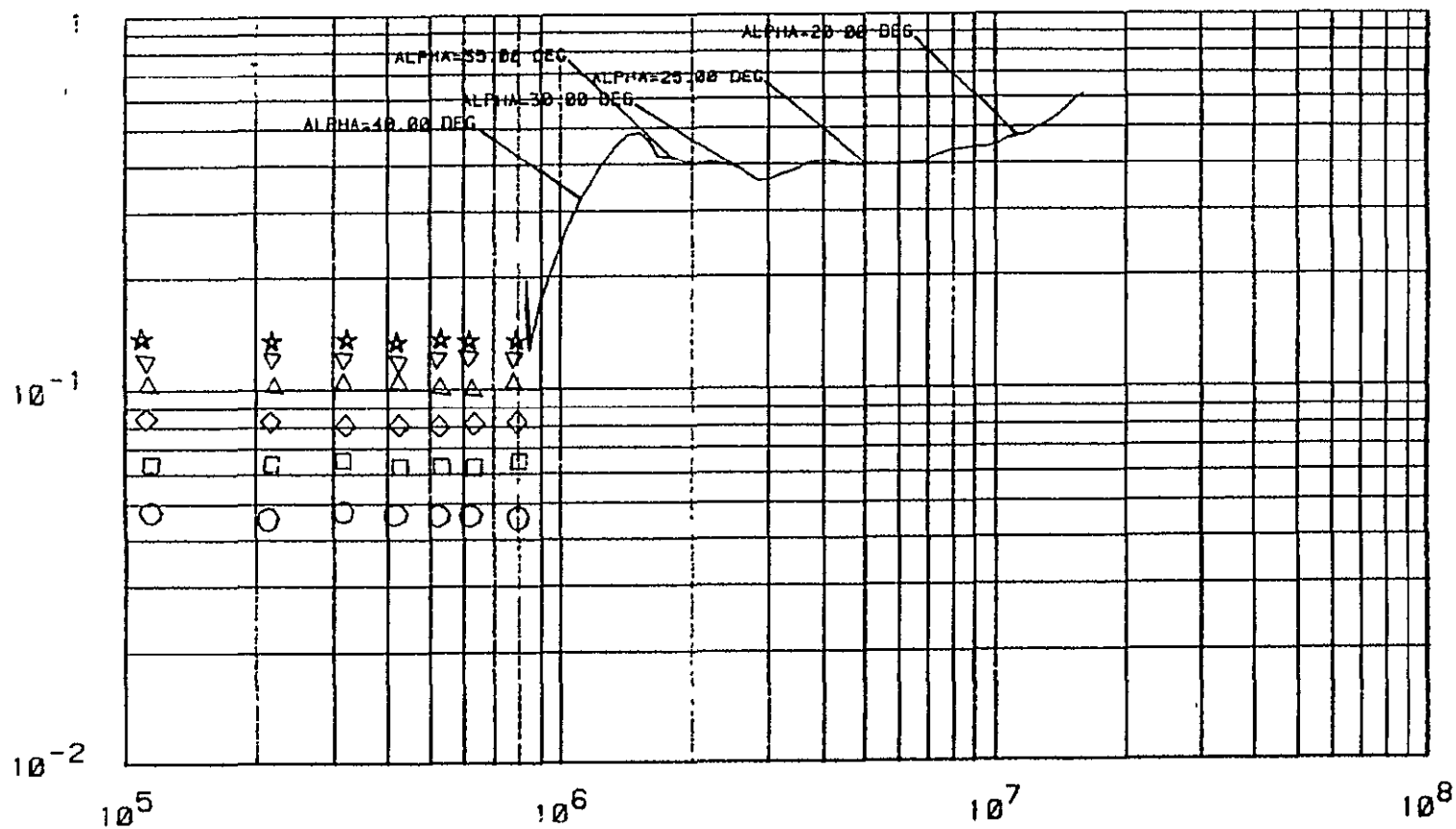
# STS-4 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

○  
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★

OH40 ALPHA = 20 DEGREES  
OH40 ALPHA = 25 DEGREES  
OH40 ALPHA = 30 DEGREES  
OH40 ALPHA = 35 DEGREES  
OH40 ALPHA = 40 DEGREES  
OH40 ALPHA = 45 DEGREES

V07T0468A/H-REF 065-1300 SEC

LINE QUALITY - INTERFERE



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B-169

REYNOLDS NUMBER (NS)

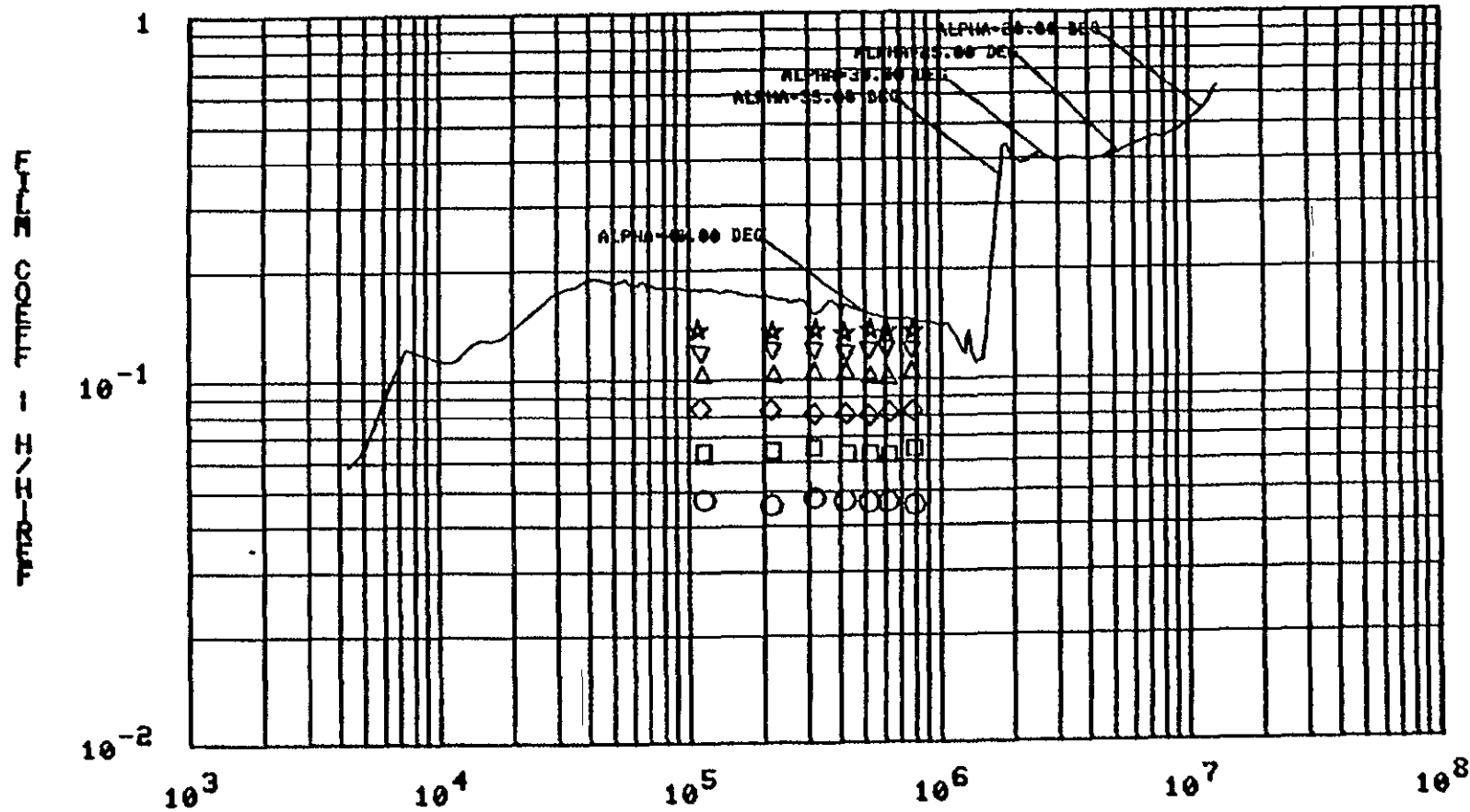
05/02/83  
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# STS-5 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9468A/H-REF 150-1350 SEC



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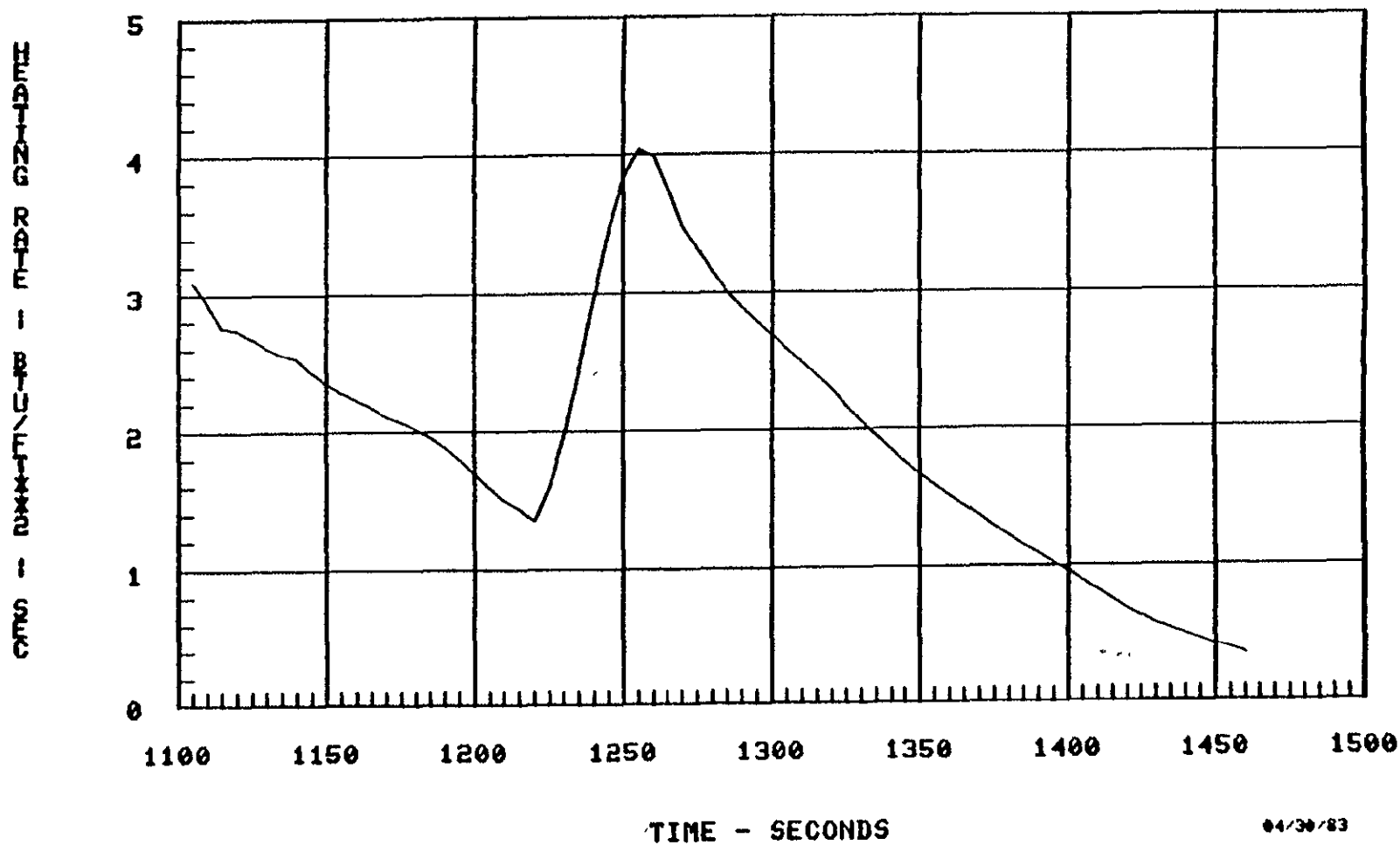
B-170

REYNOLDS NUMBER (NS)

04/28/83  
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# STS-1 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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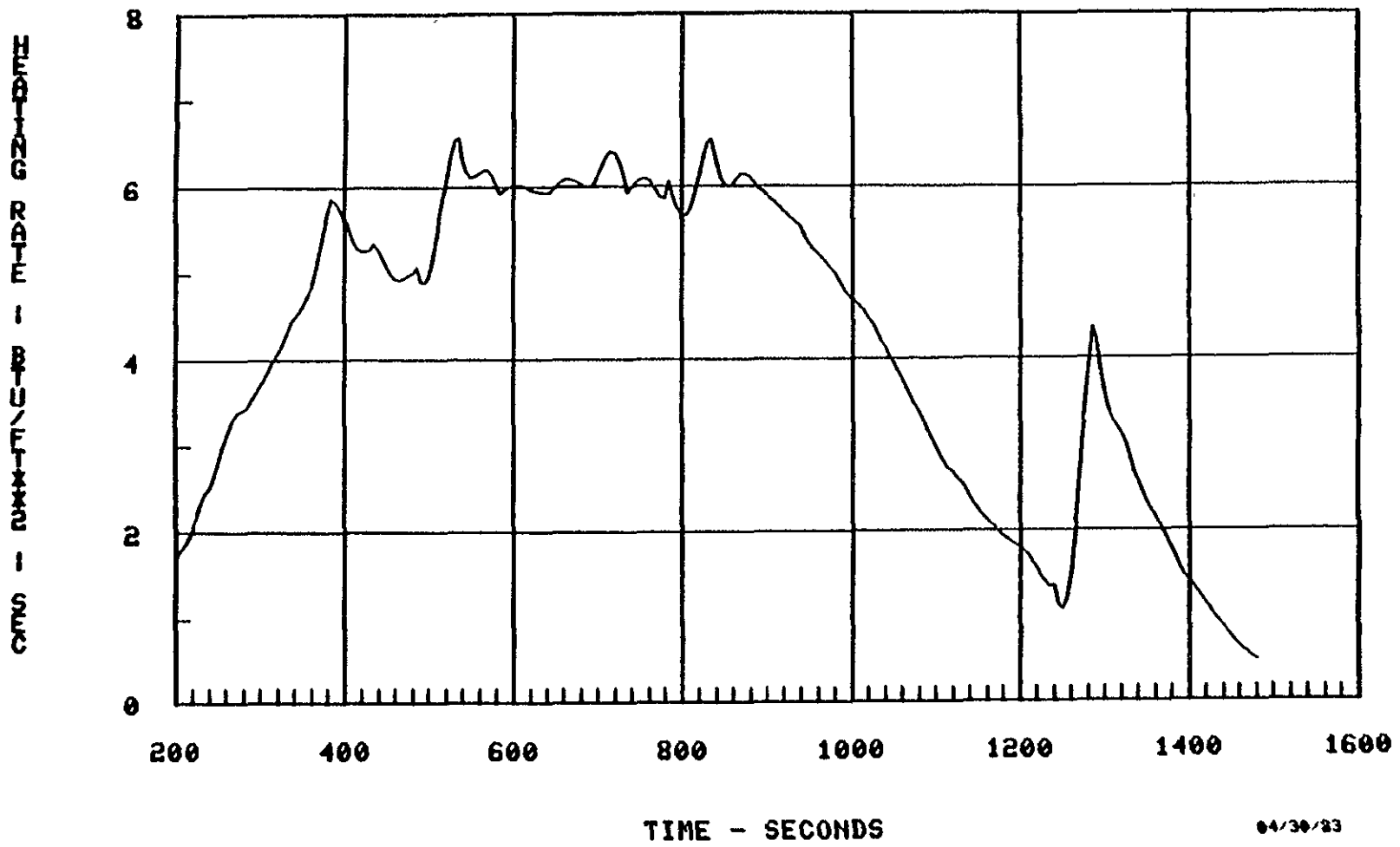
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B-171

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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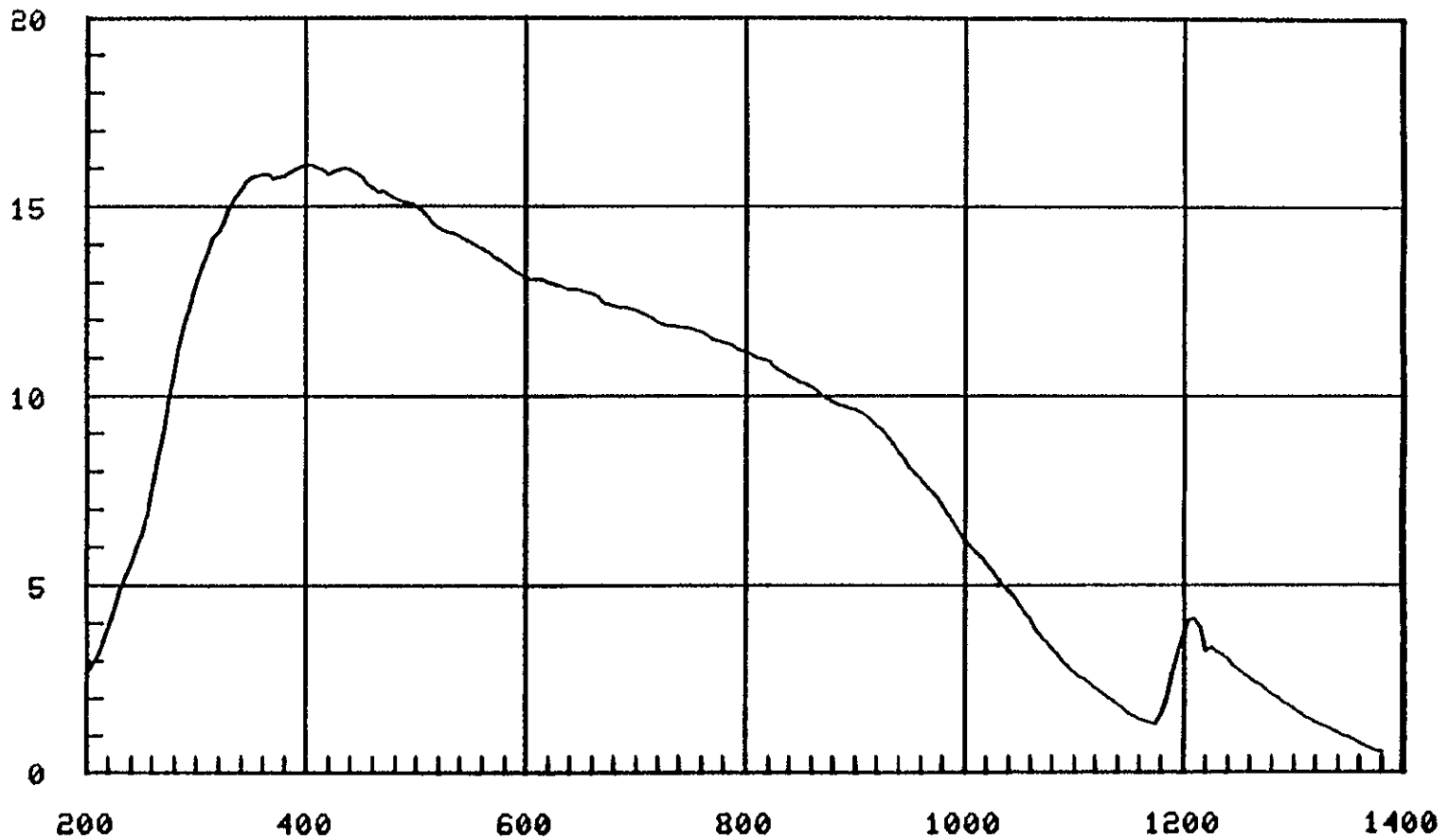
B-172

04/30/83

# STS-3 (107 FT LENGTH CL $X/L=0.30$ ) FLIGHT PARAMETER COMPARISO

U07T9468A

INCREASING REEF - 200/1000 - 5000



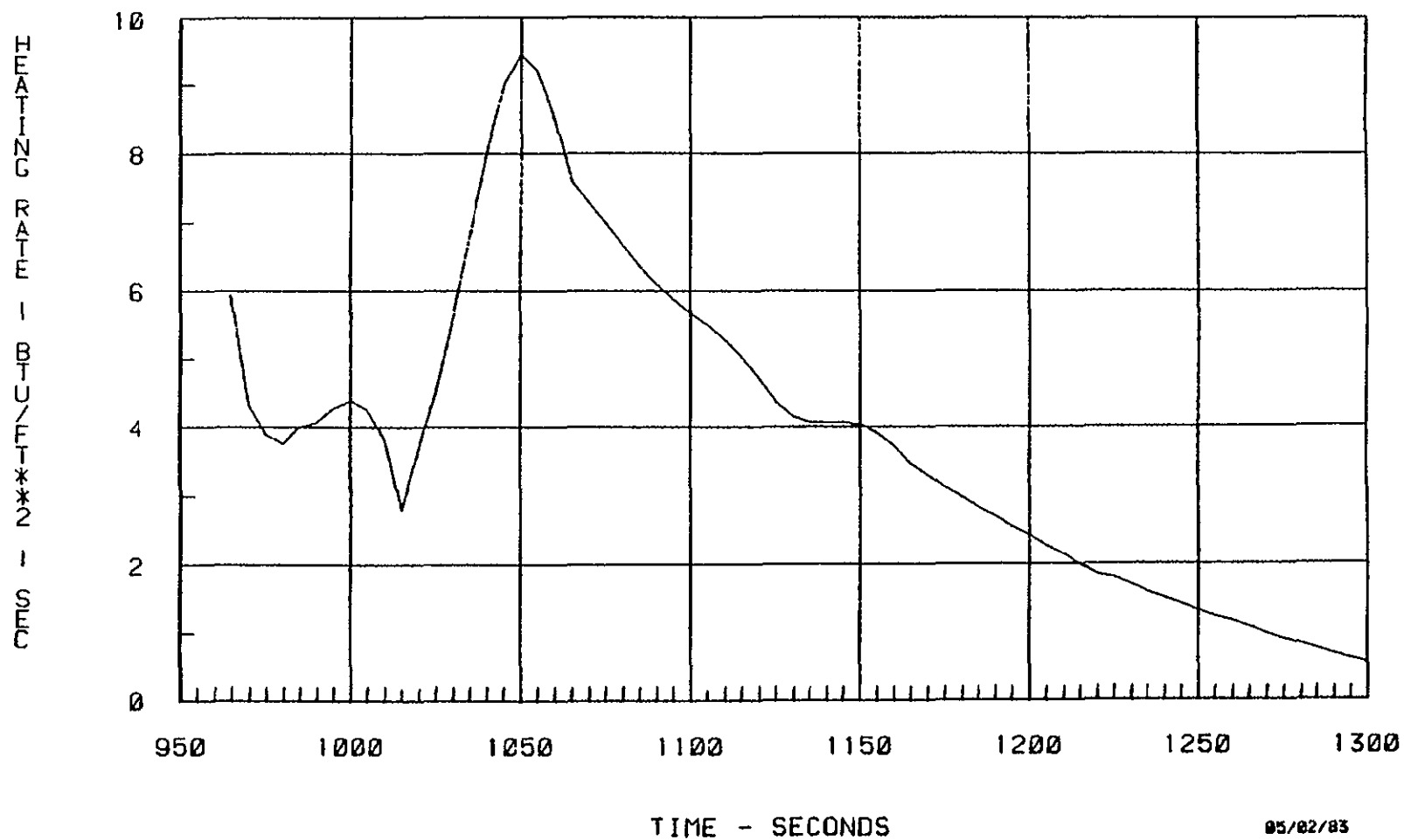
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TIME - SECONDS

04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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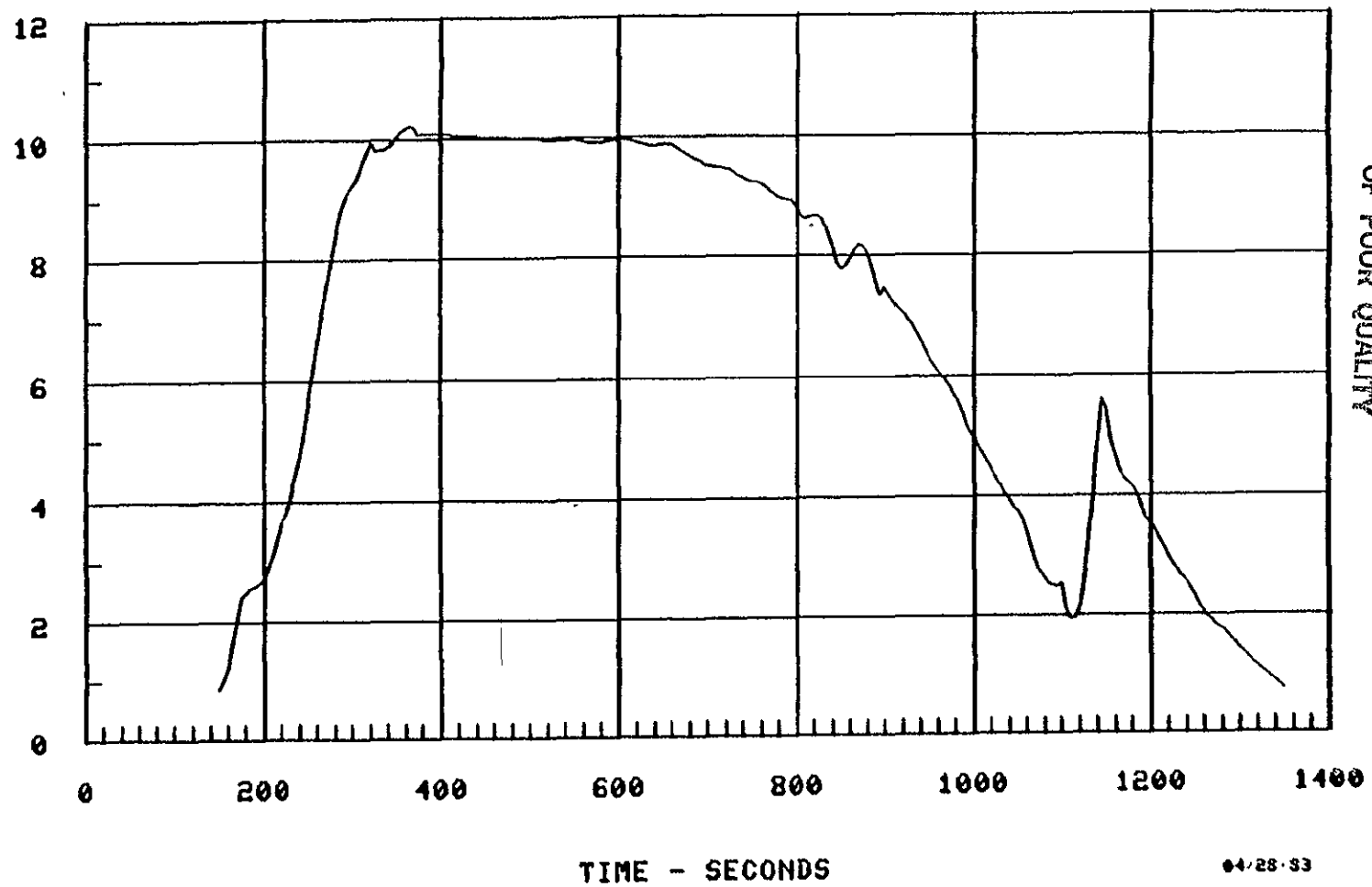
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U07T9468A

HUGHES ACFT - B-175 - 500

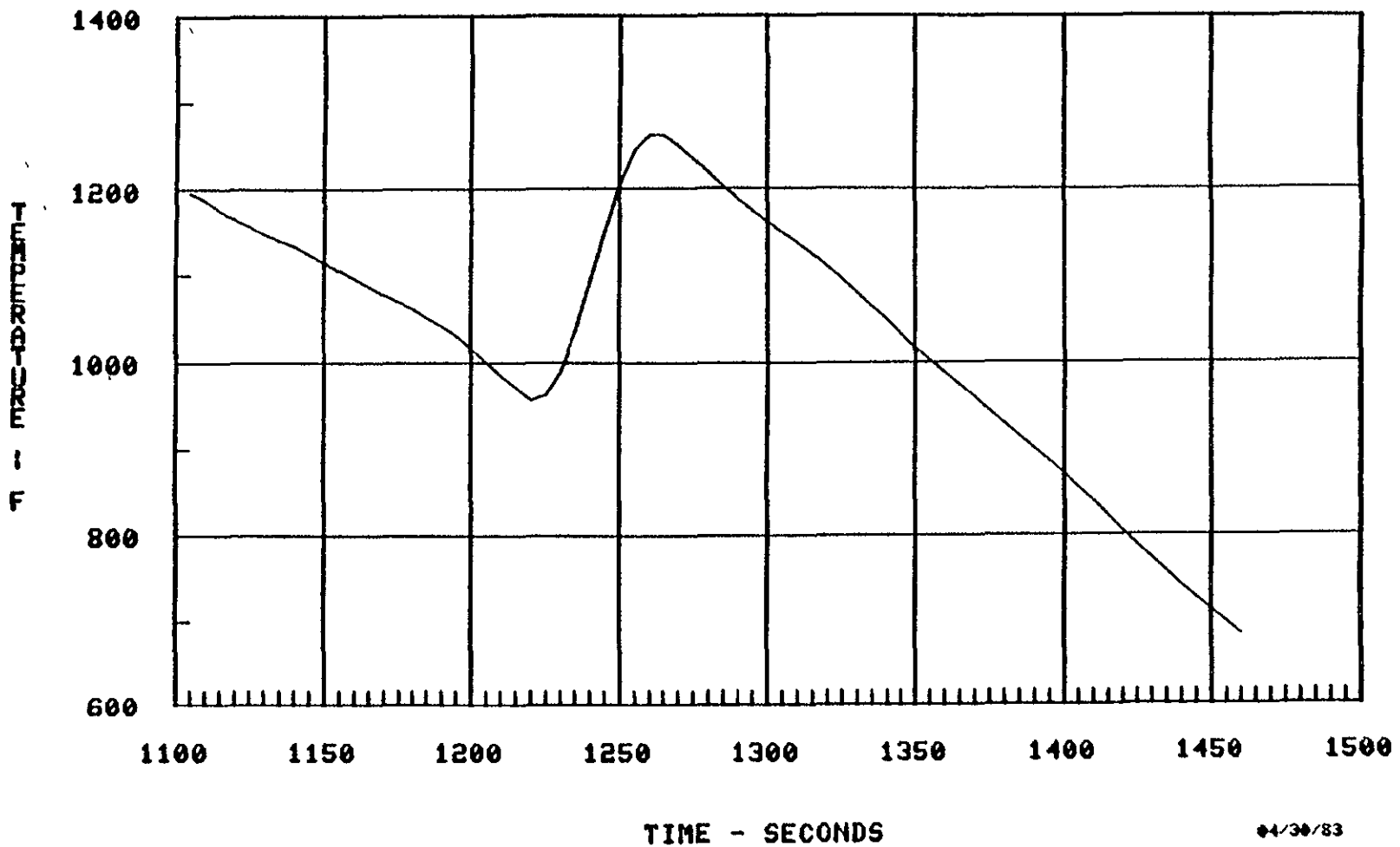
B-175

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# STS-1 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

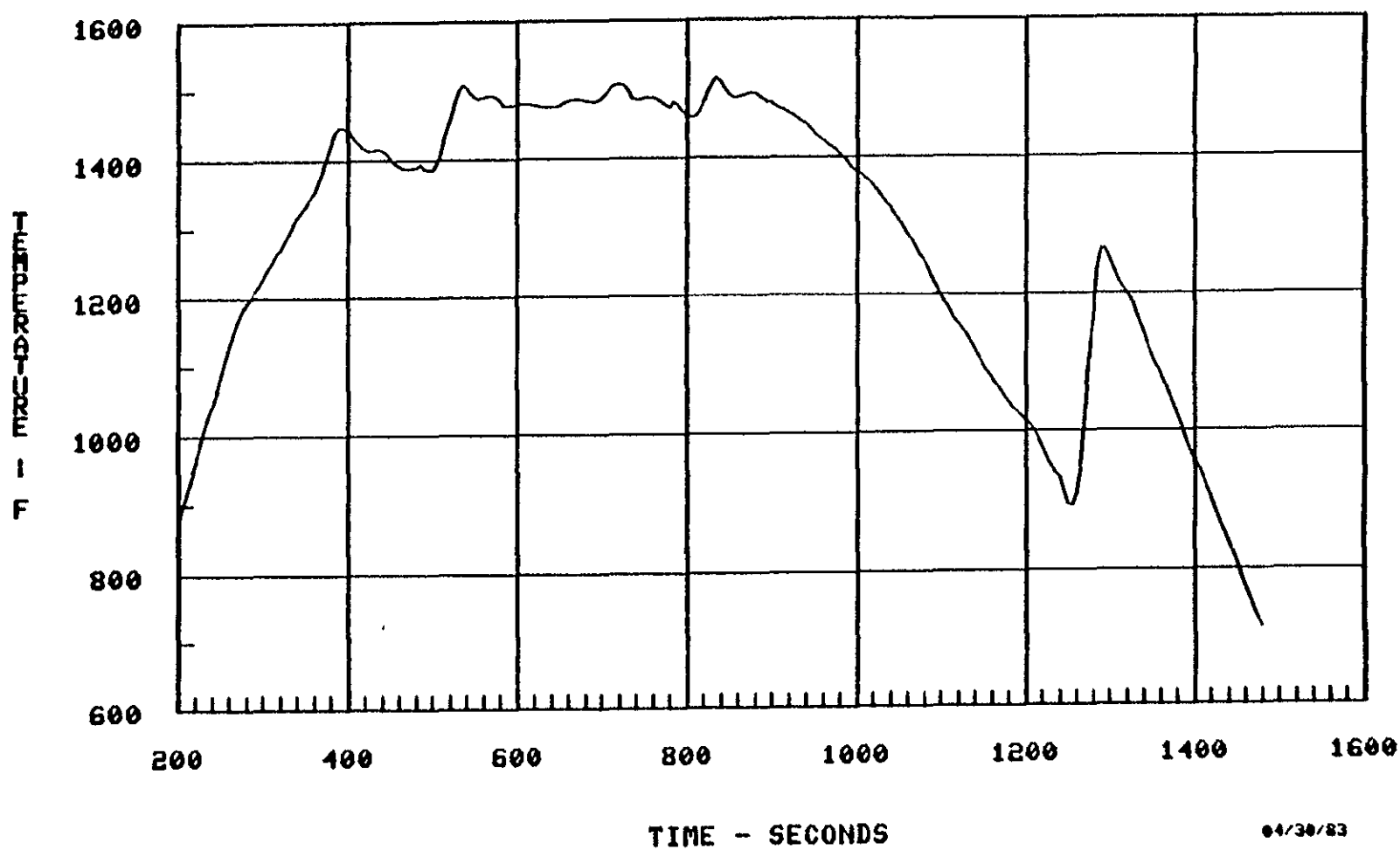
U07T9468A





# STS-2 (107 FT LENGTH CL $X/L=0.30$ ) FLIGHT PARAMETER COMPARISO

U07T9468A'



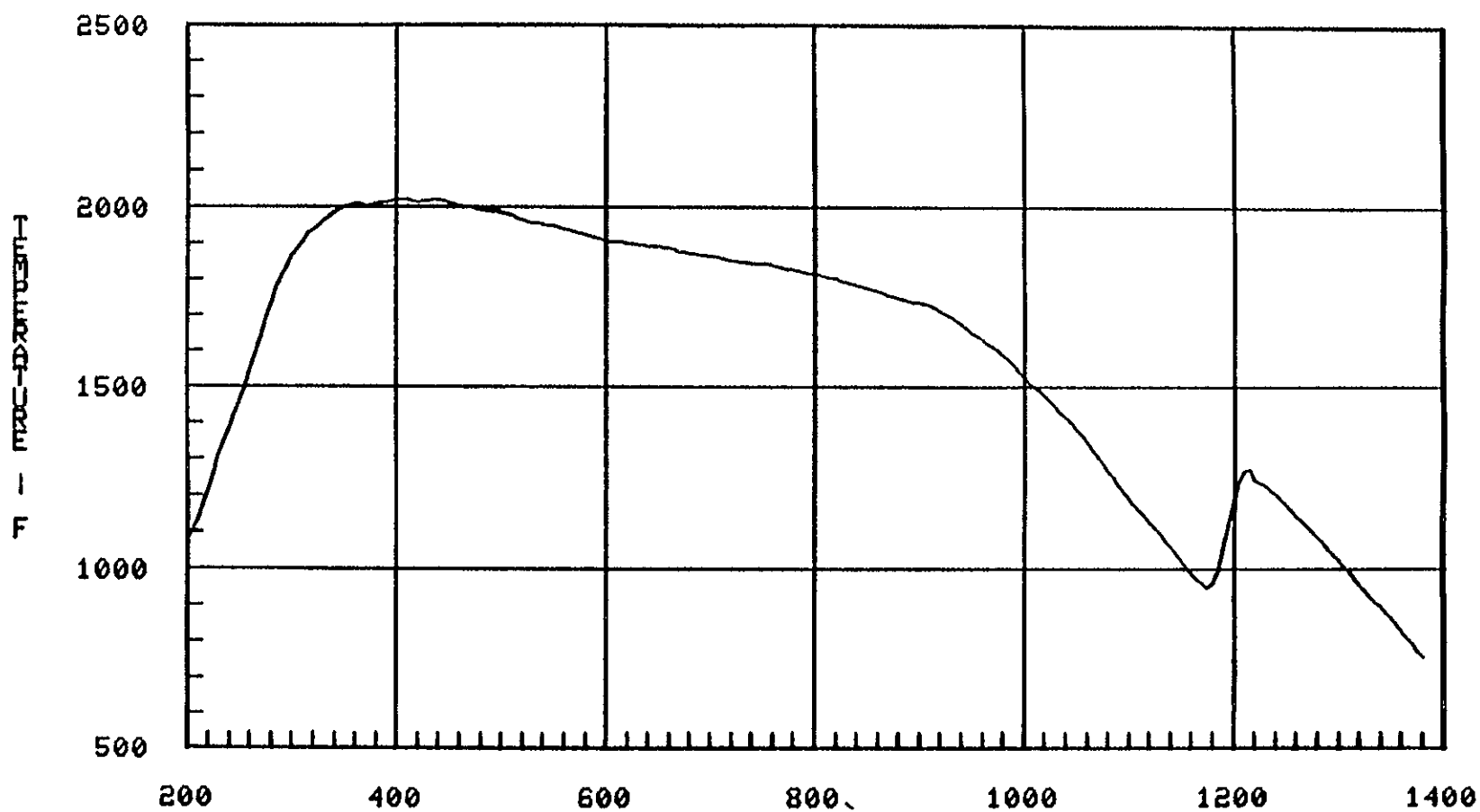
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B-177

04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

U07T9468A



B-178

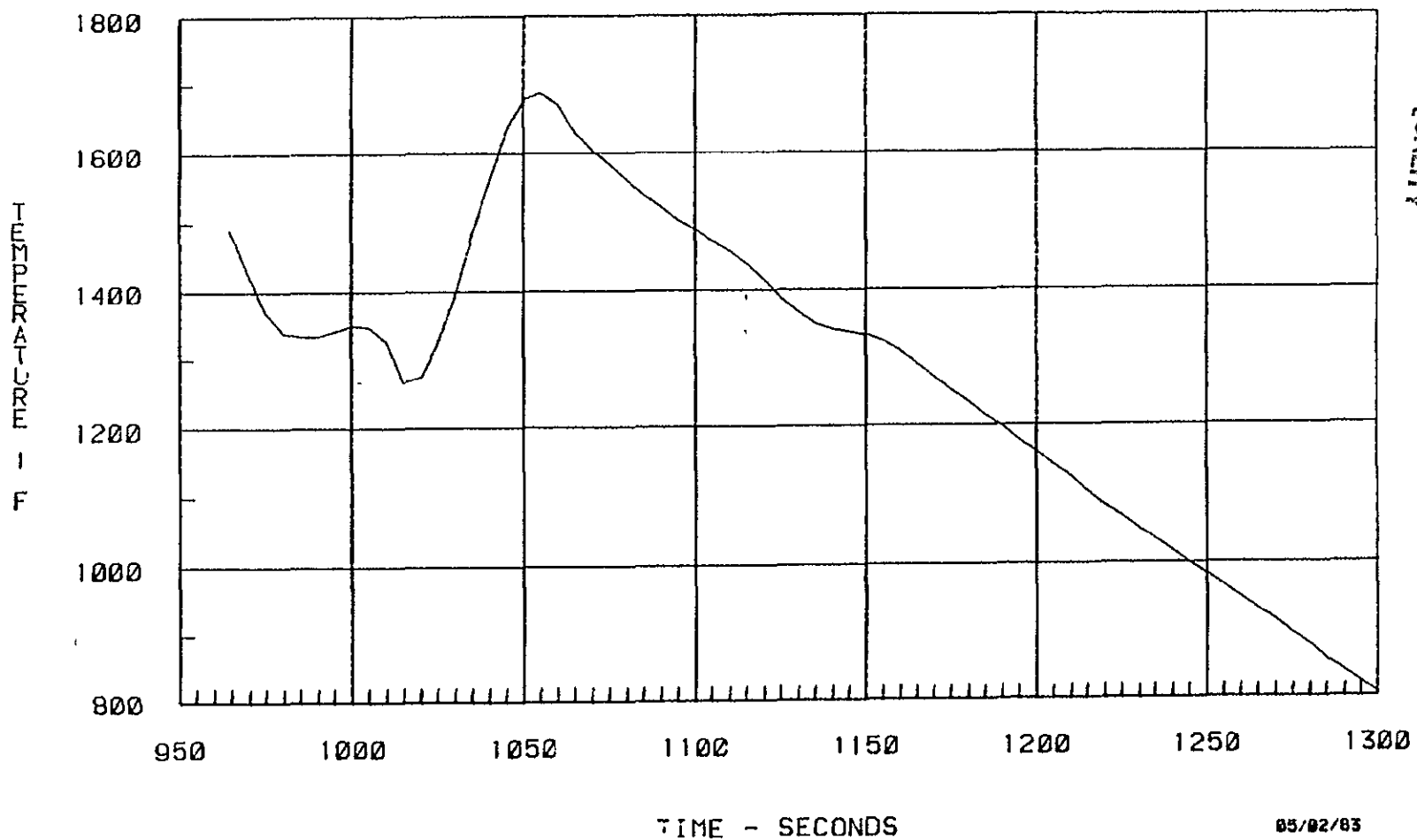
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TIME - SECONDS

04/30/83

# STS-4 (107 FT LENGTH CL $X/L=0.30$ ) FLIGHT PARAMETER COMPARISON

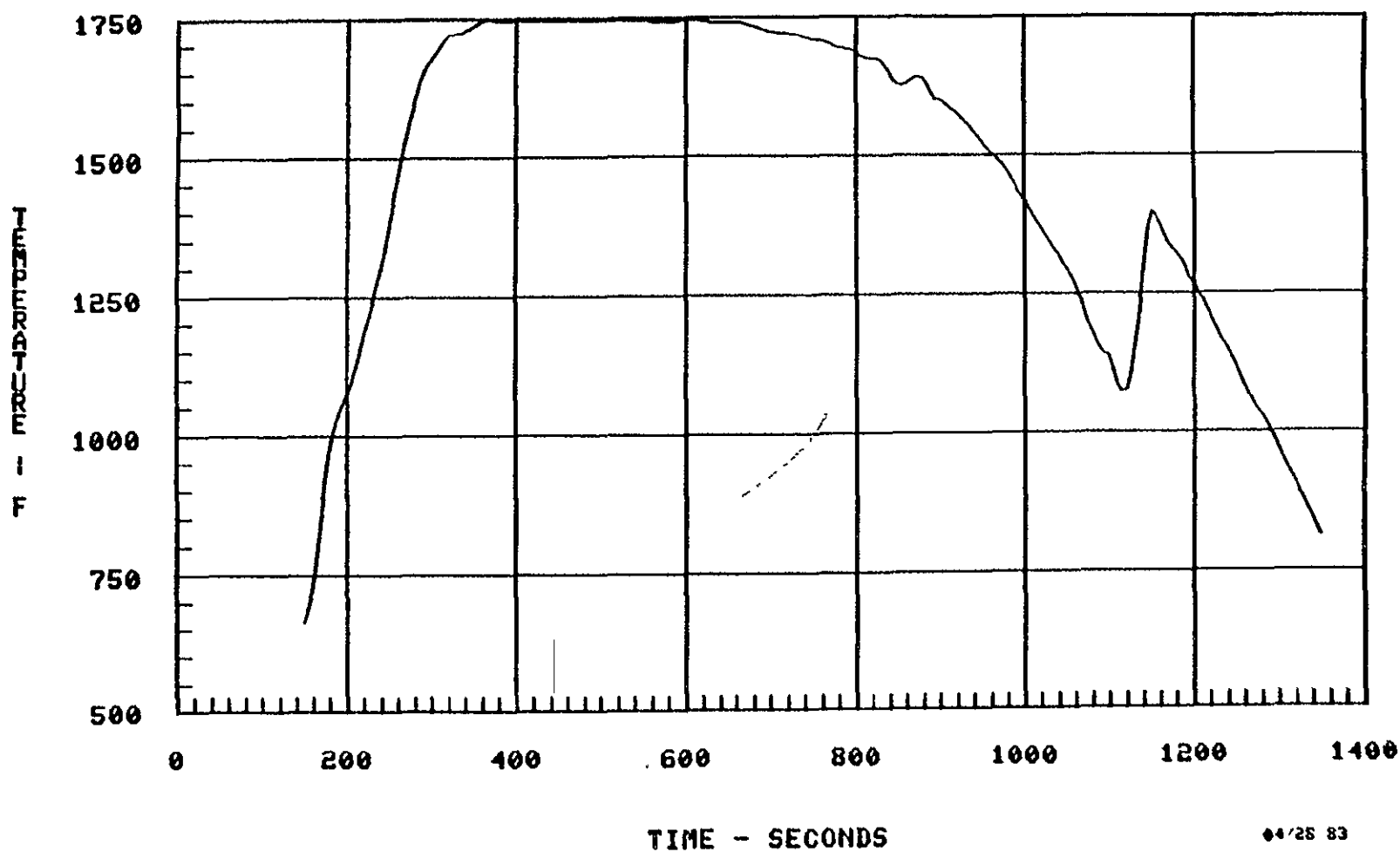
———— V07T0458A



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# STS-5 (107 FT LENGTH CL X/L=0.30) FLIGHT PARAMETER COMPARISO

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B-180

04/25 83

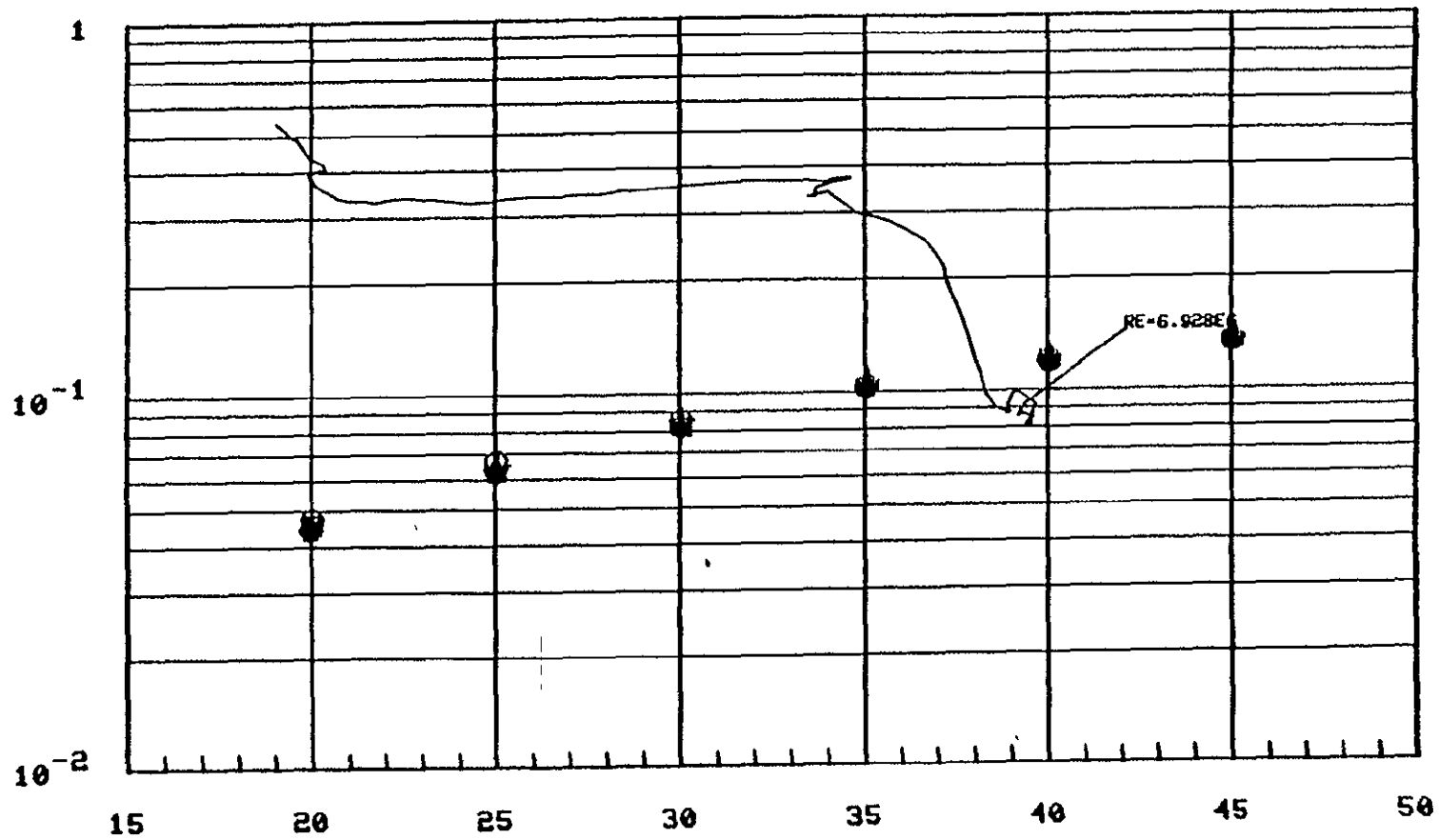
# STS-1 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9471A/H-REF 1065-1460 SEC

WAVE COEFF. - H/E-QUAL



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B-181

ANGLE-OF-ATTACK - DEG

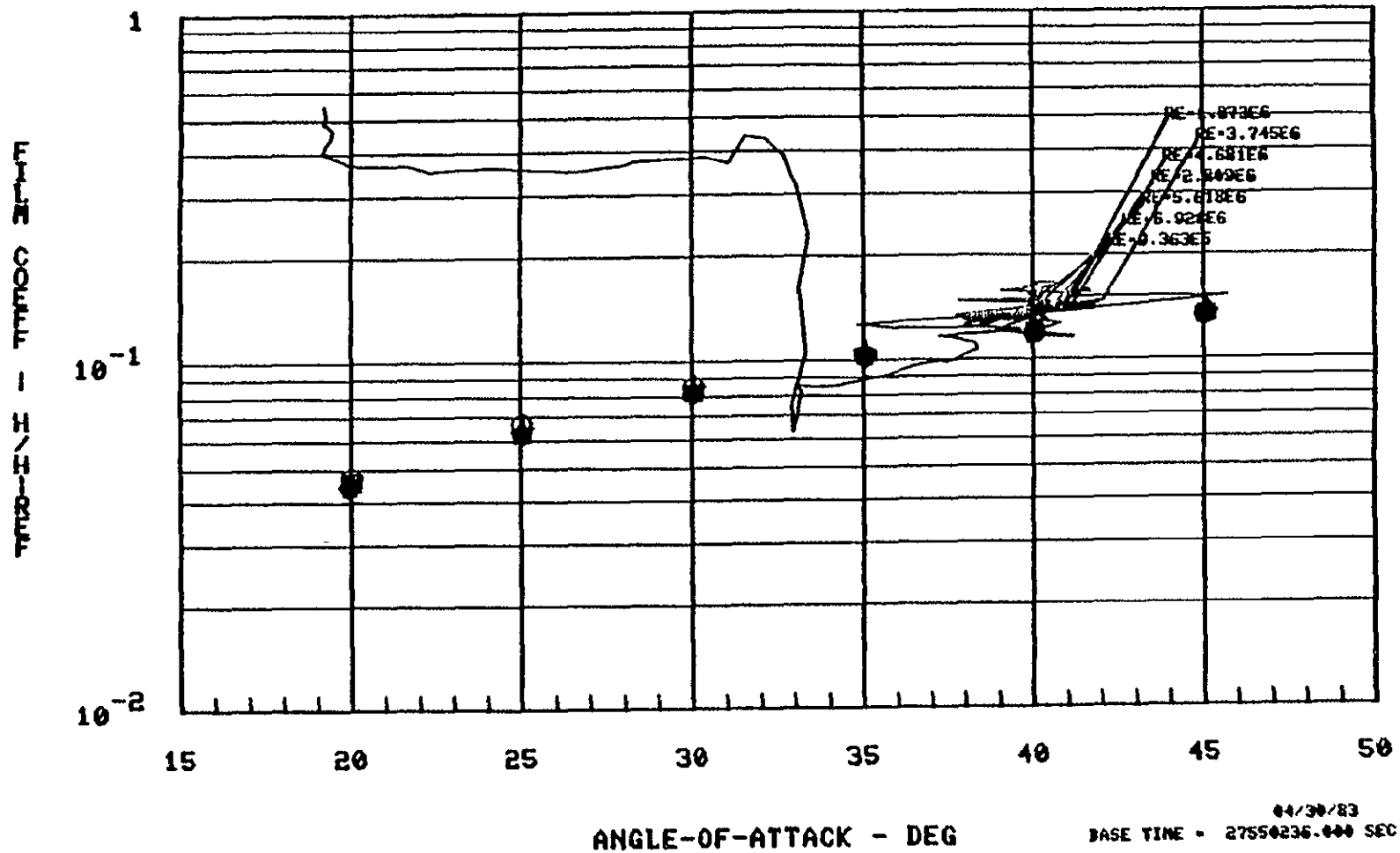
04/30/83  
BASE TIME = 09049744.000 SEC.

# STS-2 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9471A/H-REF 200-1480 SEC



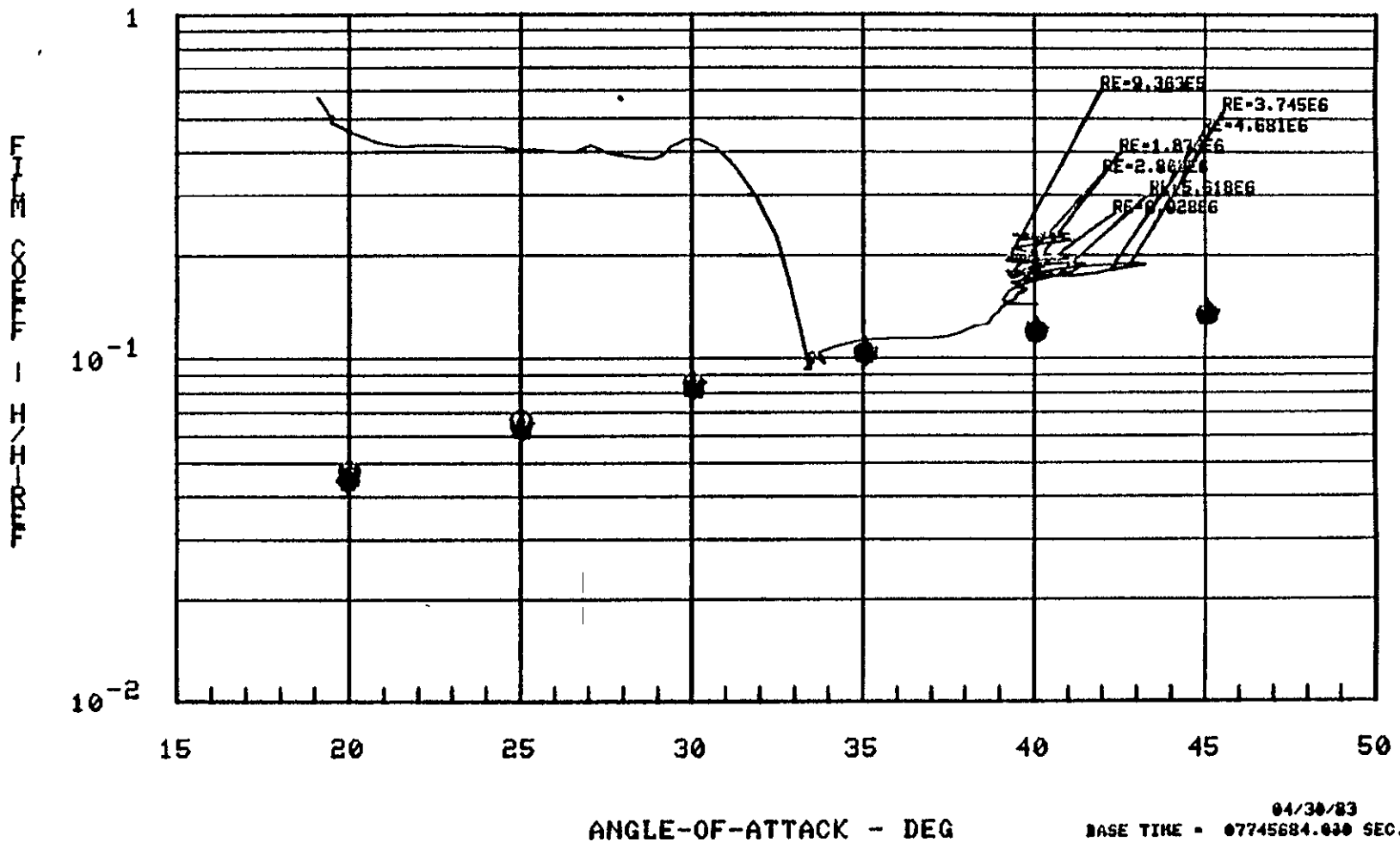
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# STS-3 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U07T9471A/H-REF 200-1380 SEC



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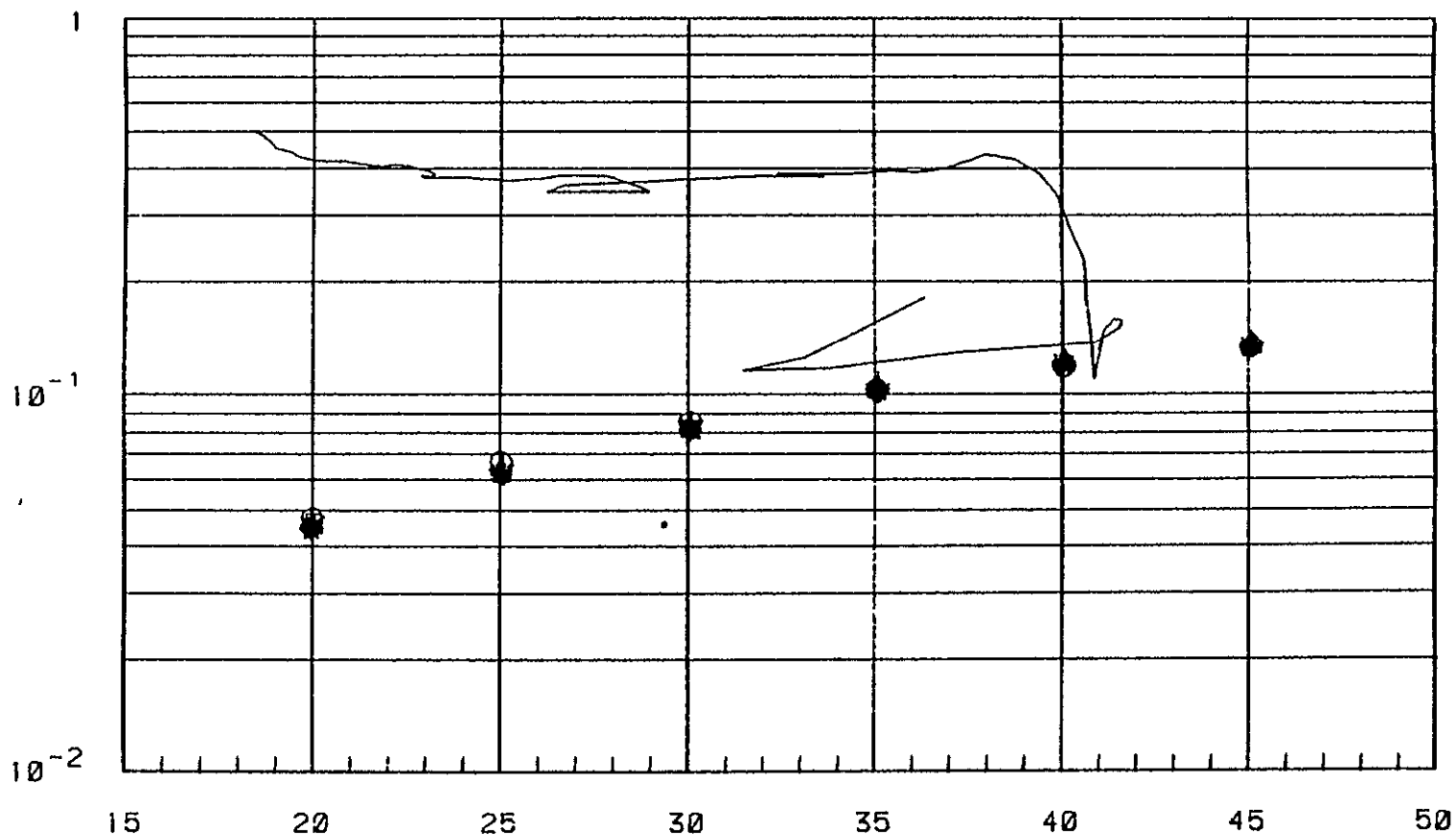
# STS-4 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

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OH40 0 0175 SCALE RE = 0.5 E06  
 OH40 0 0175 SCALE RE = 1 0 E06  
 OH40 0 0175 SCALE RE = 1.5 E06  
 OH40 0 0175 SCALE RE = 2.0 E06  
 OH40 0 0175 SCALE RE = 2.5 E06  
 OH40 0 0175 SCALE RE = 3 0 E06  
 OH40 0 0175 SCALE RE = 3 7 E06

V07T0471A/H-REF 065-1300 SEC

U-I-E COULLE - H-I-GRILL



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ANGLE-OF-ATTACK - DEG

05/02/83  
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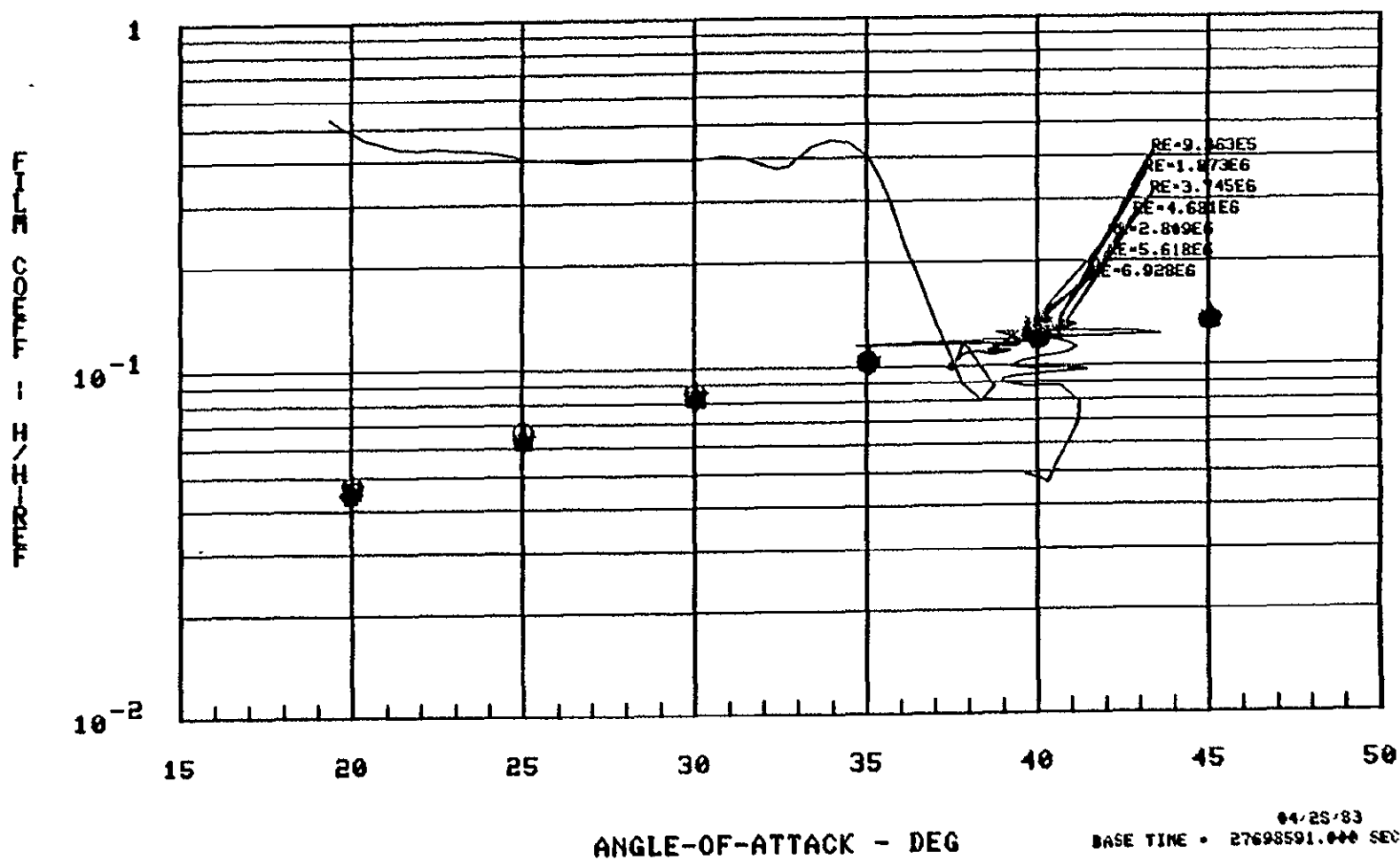


# STS-5 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

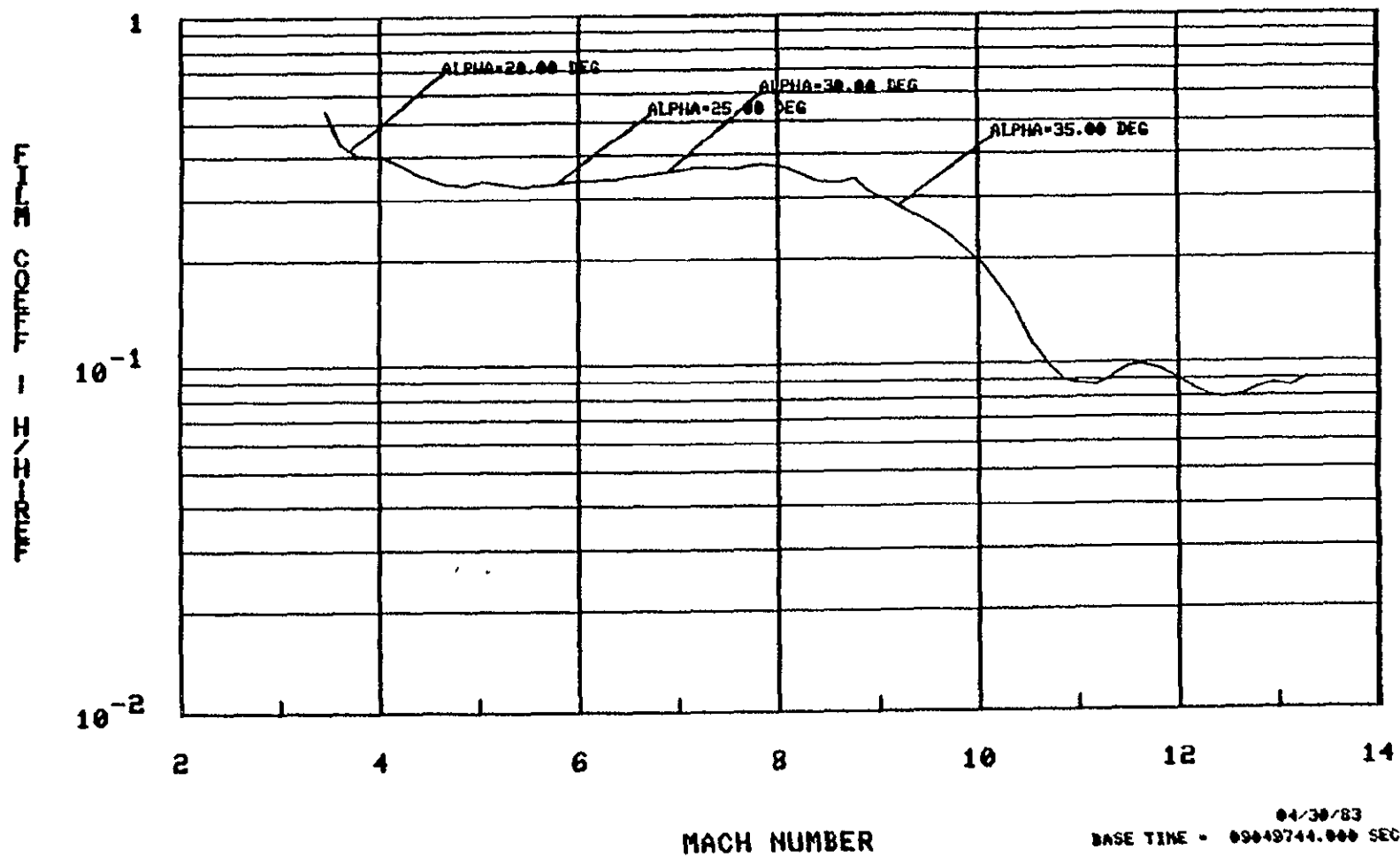
U07T9471A/H-REF 150-1350 SEC



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QUALITY

# STS-1 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

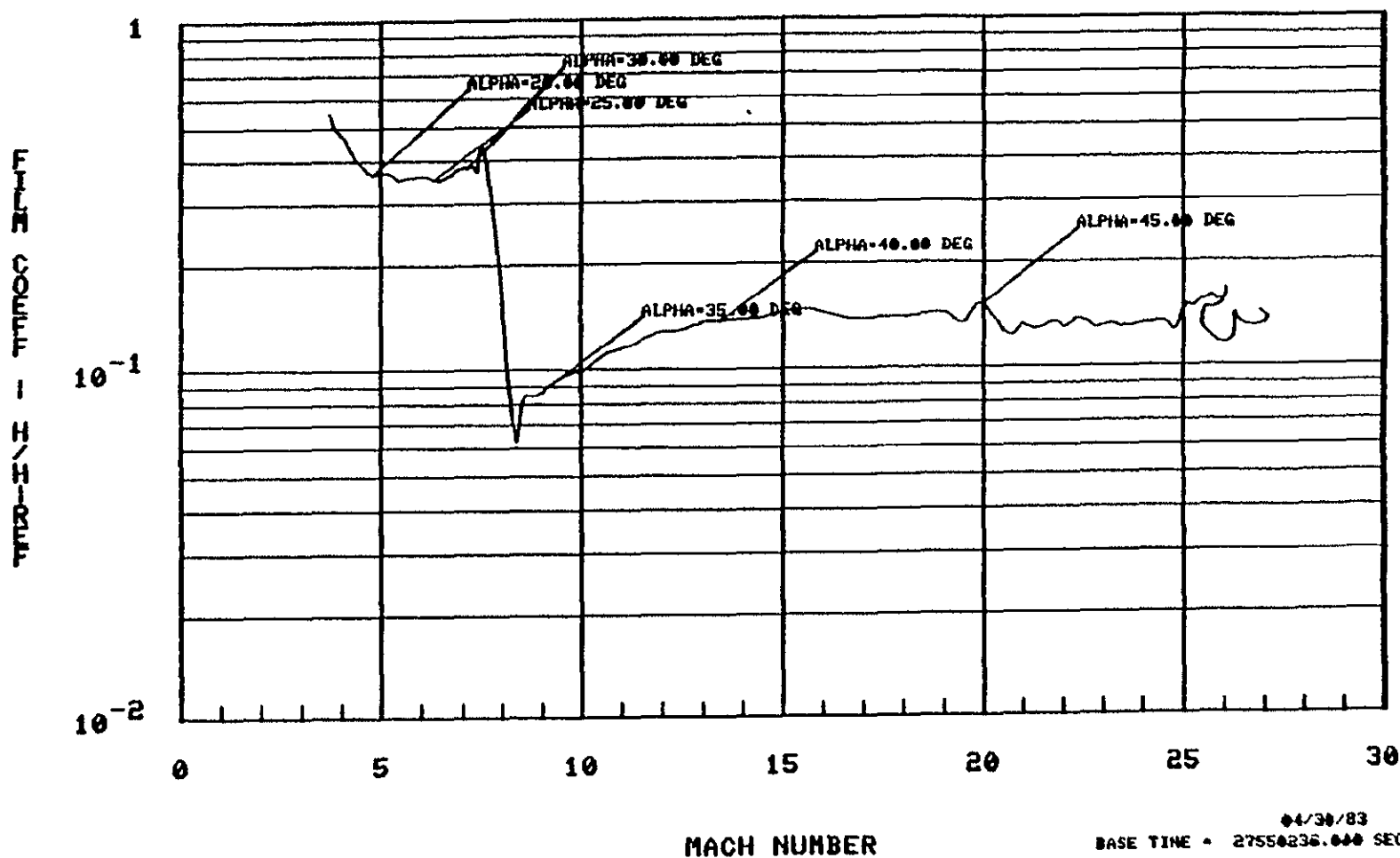
U07T9471A/H-REF 1065-1460 SEC



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# STS-2 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

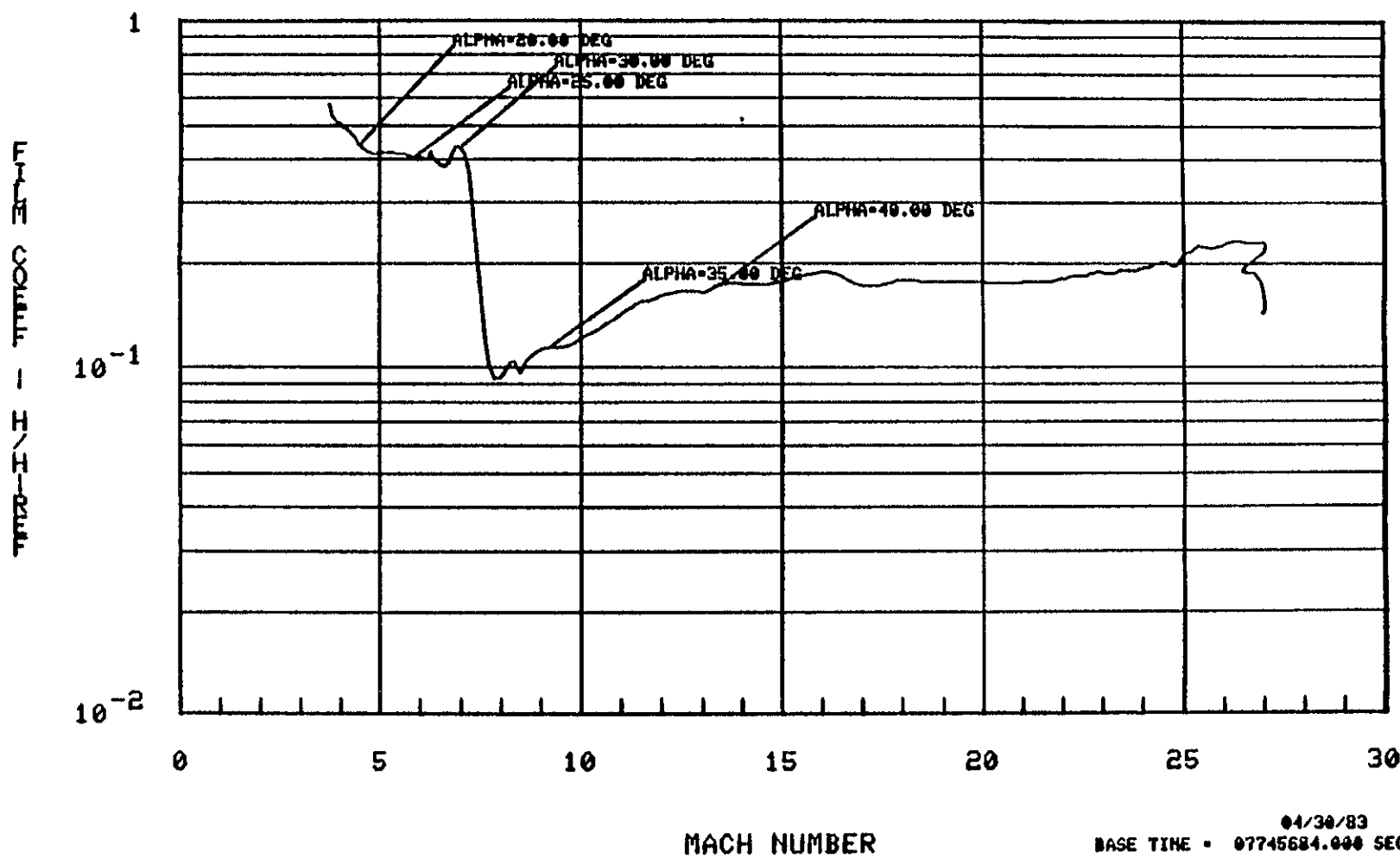
U07T9471A/H-REF 200-1480 SEC



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# ST5-3 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A/H-REF 200-1380 SEC



B-188

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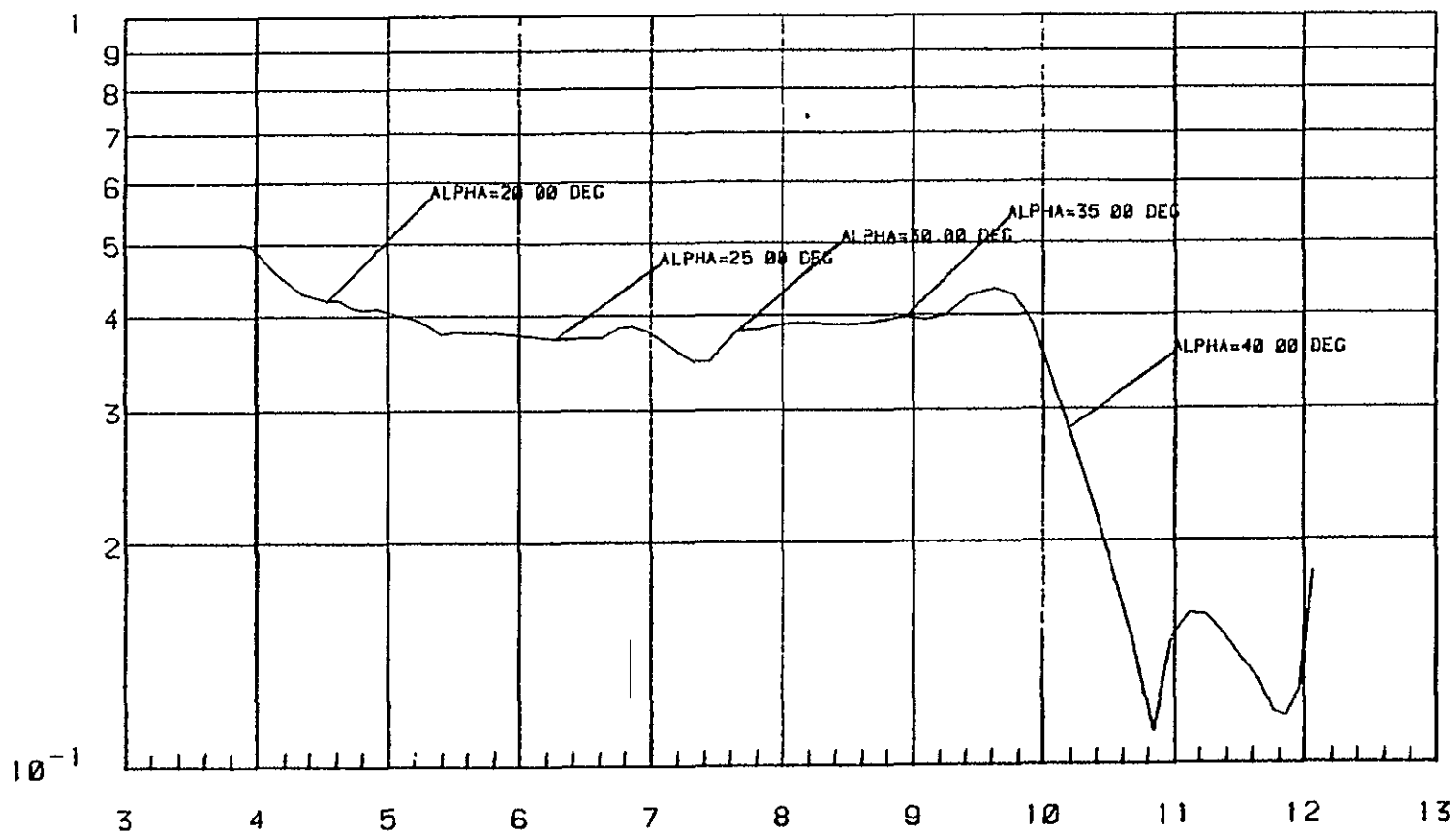
04/30/83

BASE TIME = 07745684.000 SEC.

# STS-4 (107 FT LENGTH CL $X/L=0.40$ ) FLIGHT PARAMETER COMPARISON

VB7T0471A/H-REF 065-1300 SEC

LINE CODE - H-I-REF



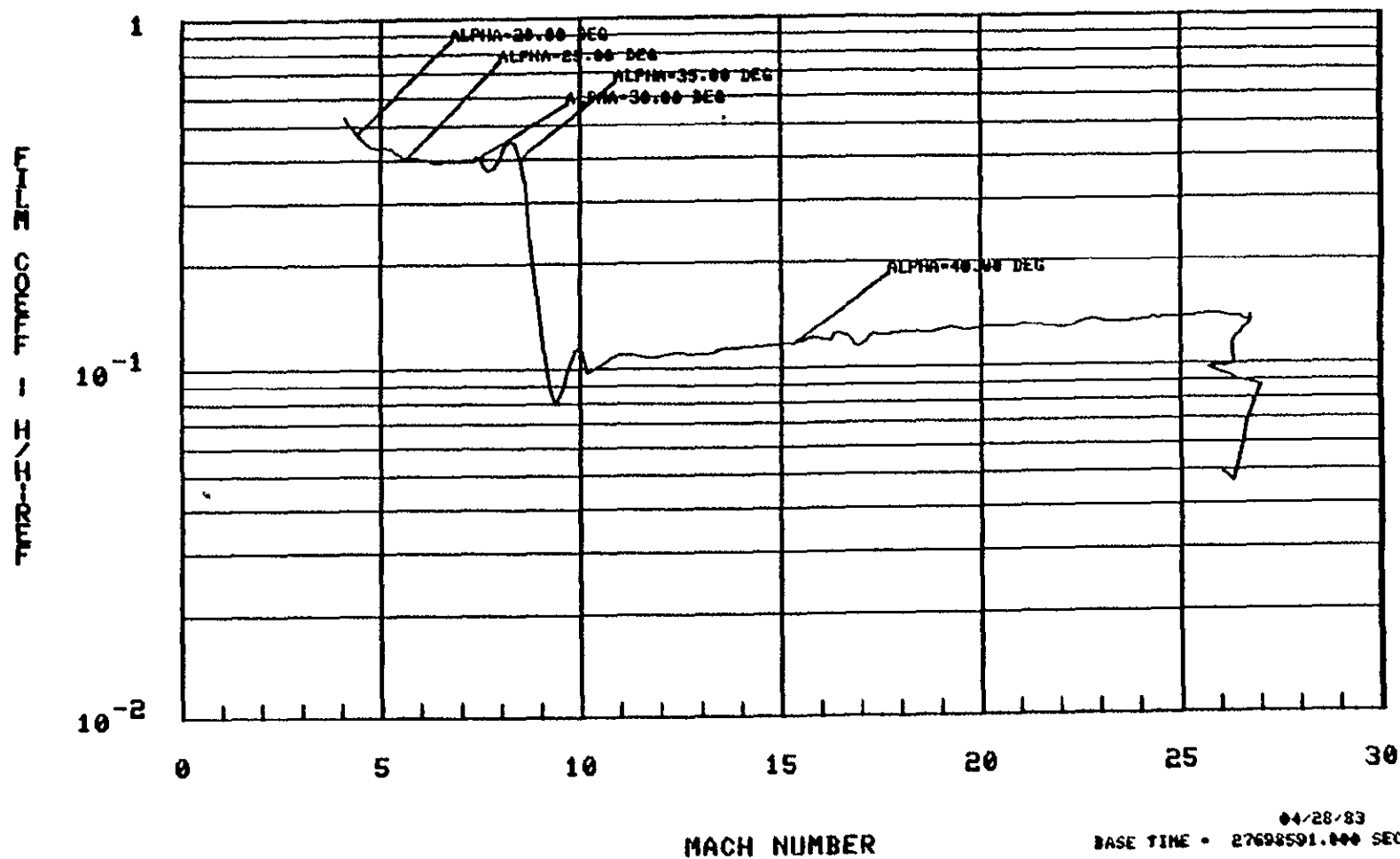
MACH NUMBER

05/02/83  
BASE TIME = 1804023.000 SEC.

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# STS-5 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A/H-REF 150-1350 SEC



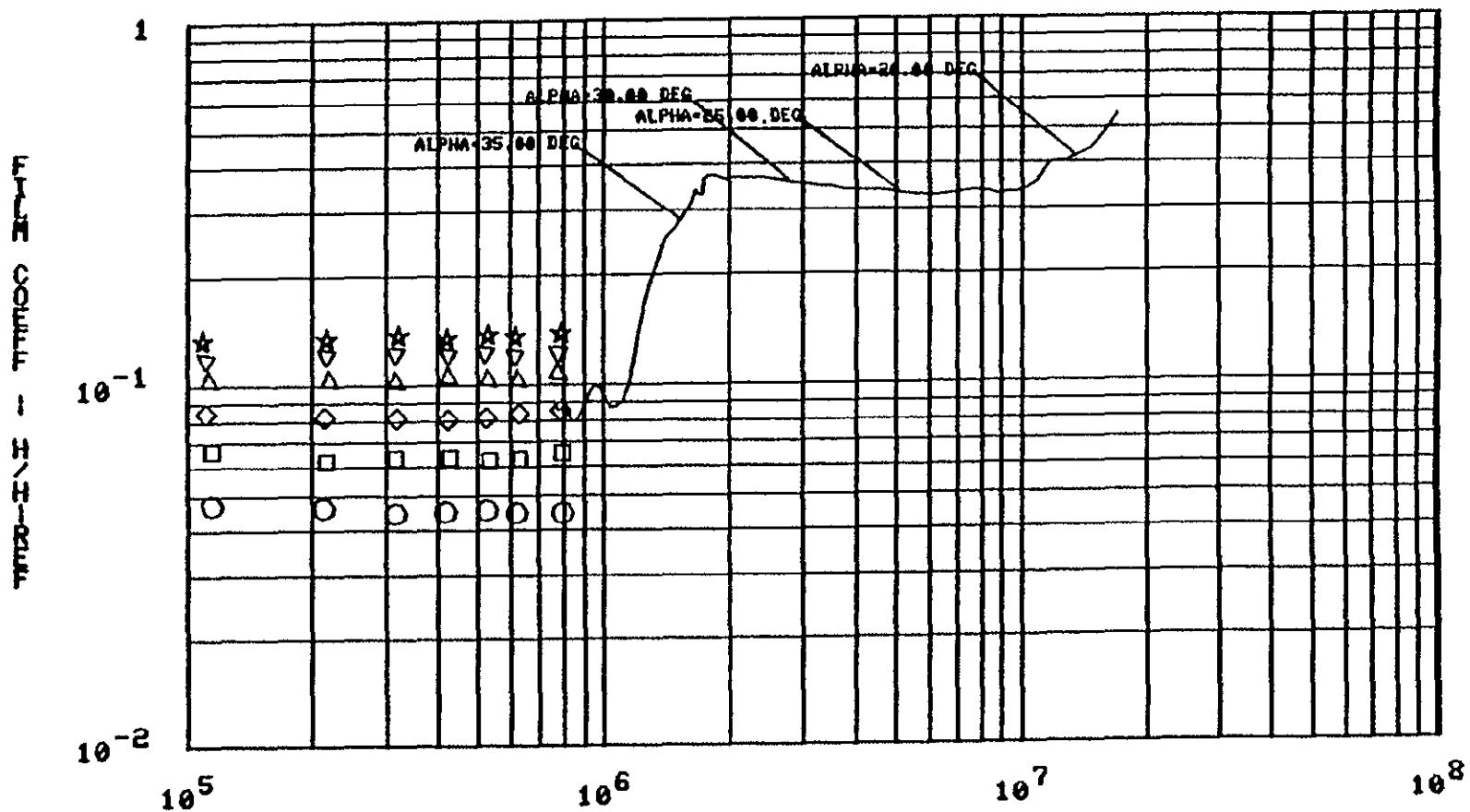
B-190

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# STS-1 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

○ OH49 ALPHA = 20 DEGREES  
 □ OH49 ALPHA = 25 DEGREES  
 ◇ OH49 ALPHA = 30 DEGREES  
 △ OH49 ALPHA = 35 DEGREES  
 ▼ OH49 ALPHA = 40 DEGREES  
 ★ OH49 ALPHA = 45 DEGREES

U07T9471A/H-REF 1065-1460 SEC



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B-191

REYNOLDS NUMBER (NS)

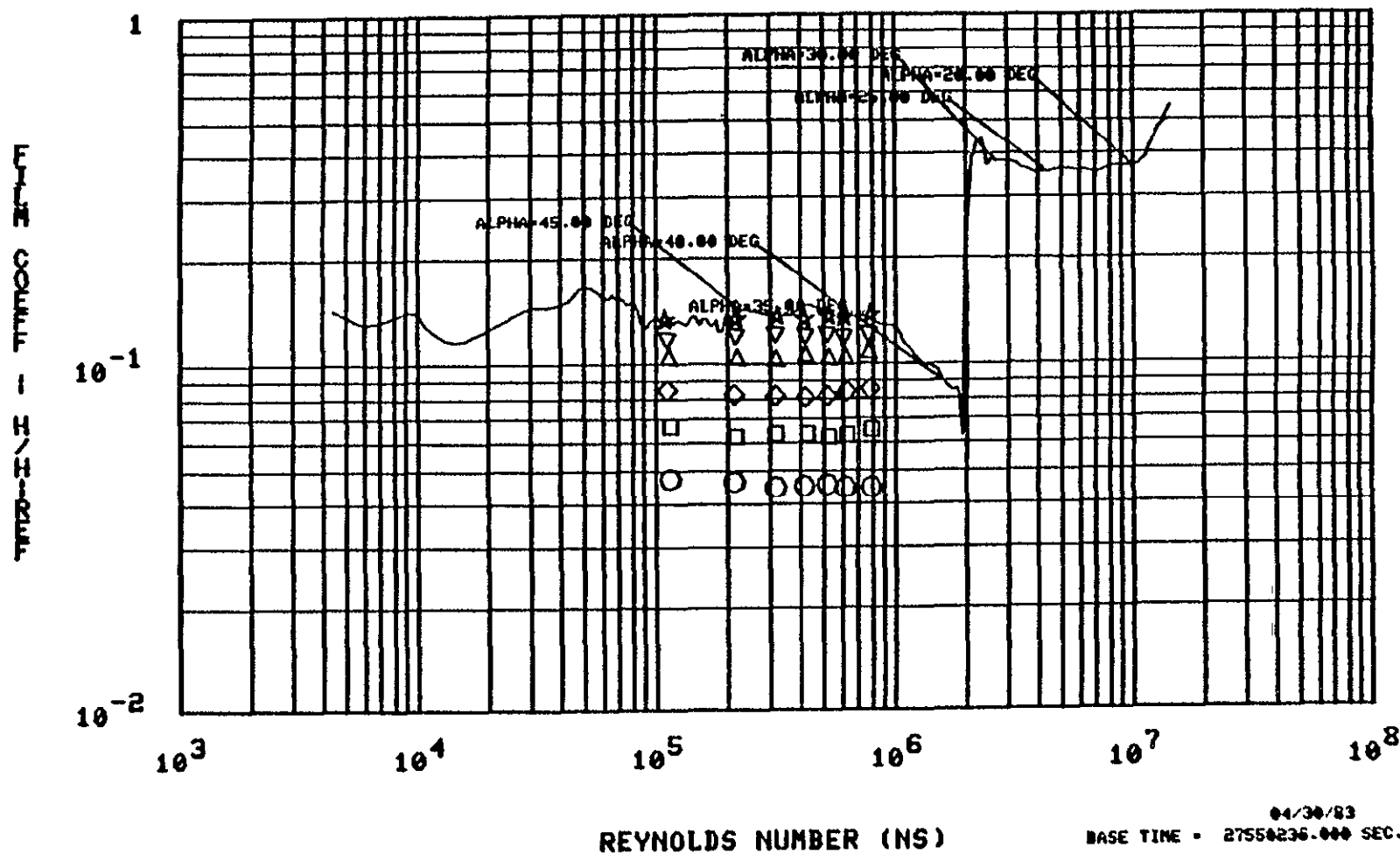
04/30/83  
BASE TIME = 00049744.000 SEC.

# STS-2 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

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□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9471A/H-REF 200-1480 SEC



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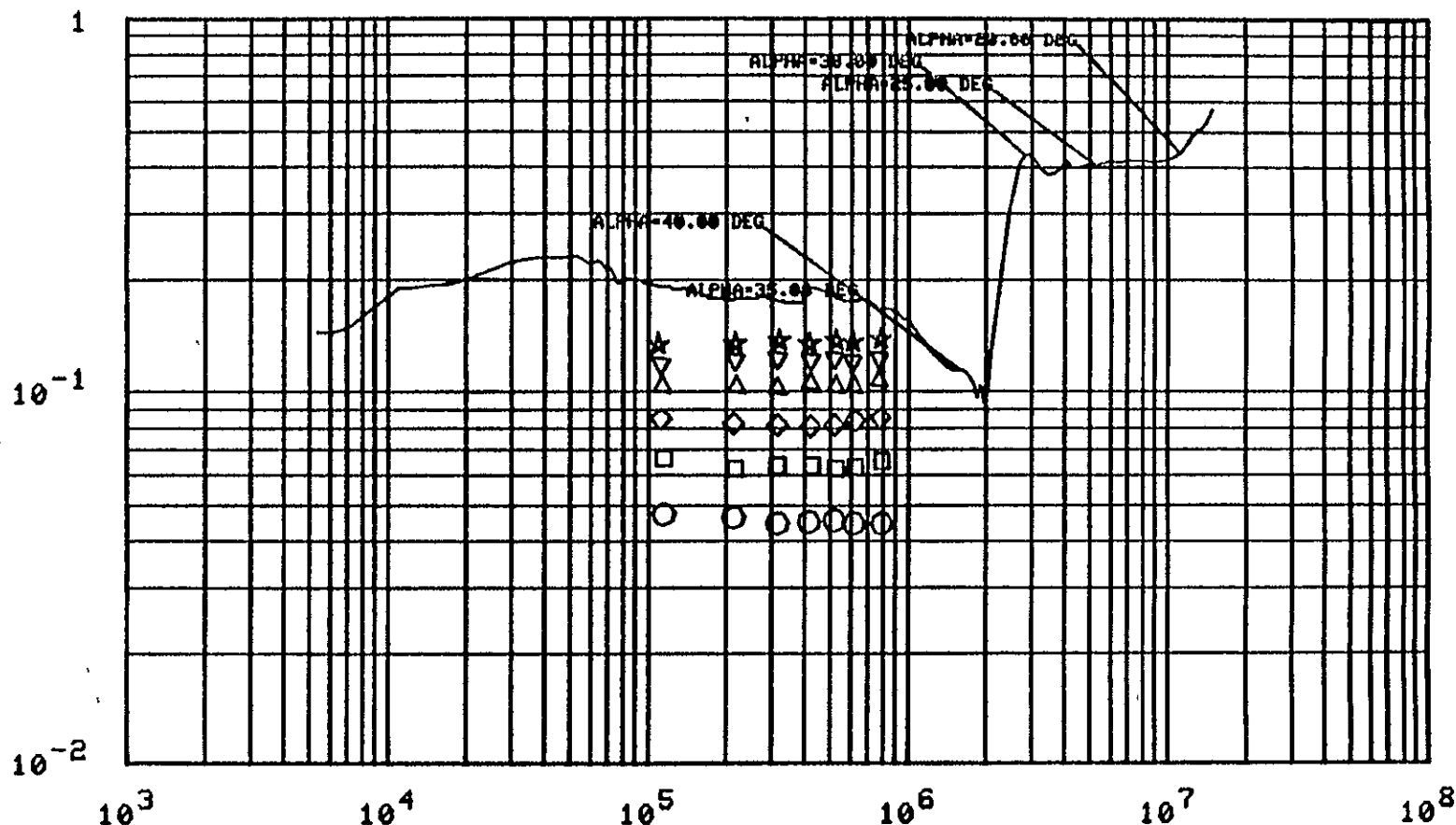
# ST5-3 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

○  
◇  
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★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9471A/H-REF 200-1380 SEC

WAVE COEFF - I/I-0.001



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B-193

REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME = 07745684.000 SEC.

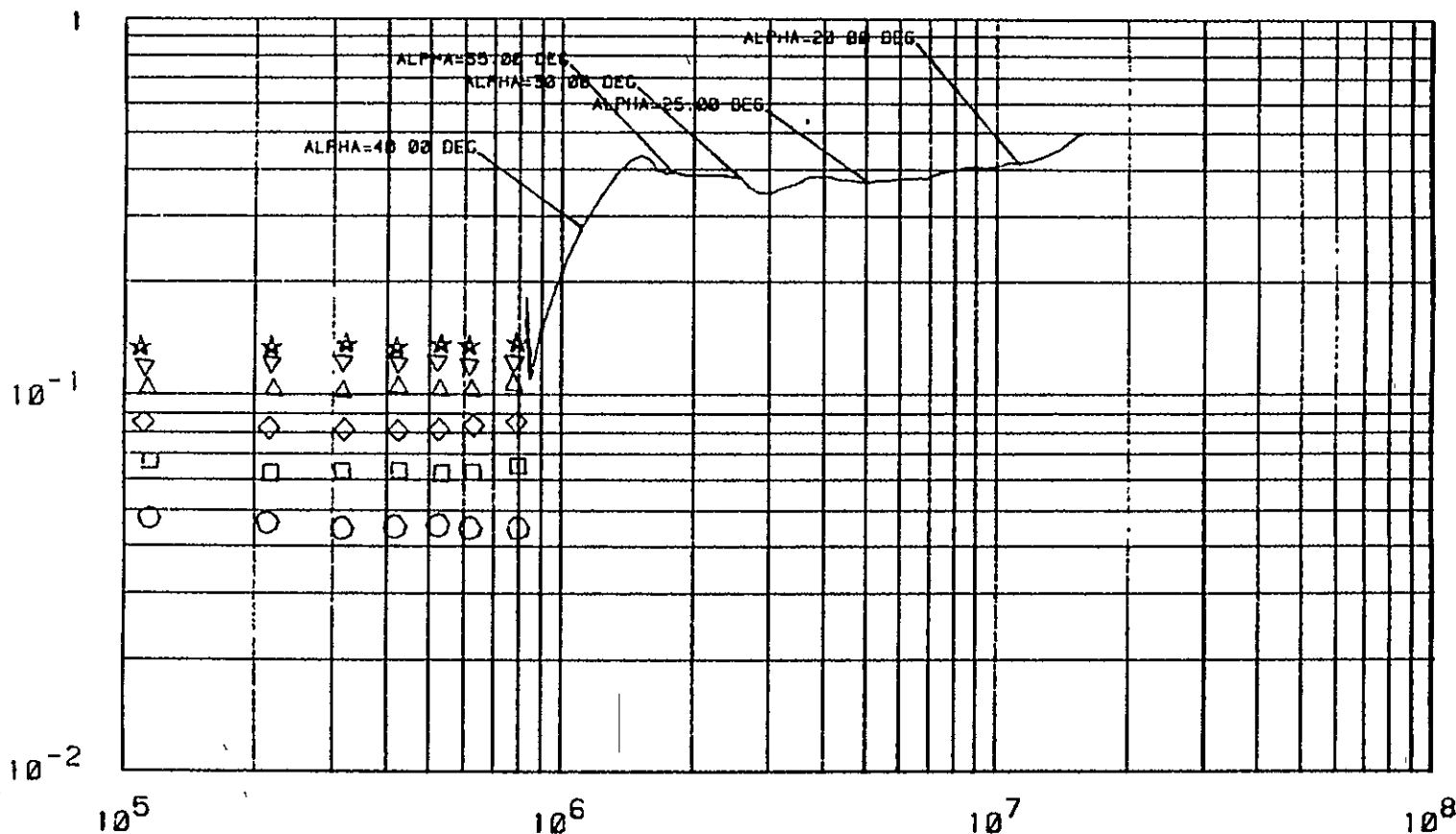
# STS-4 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

V07T0471A/H-REF 065-1300 SEC

FLIGHT COEFFICIENT - H-I-CRUE



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B-194

REYNOLDS NUMBER (NS)

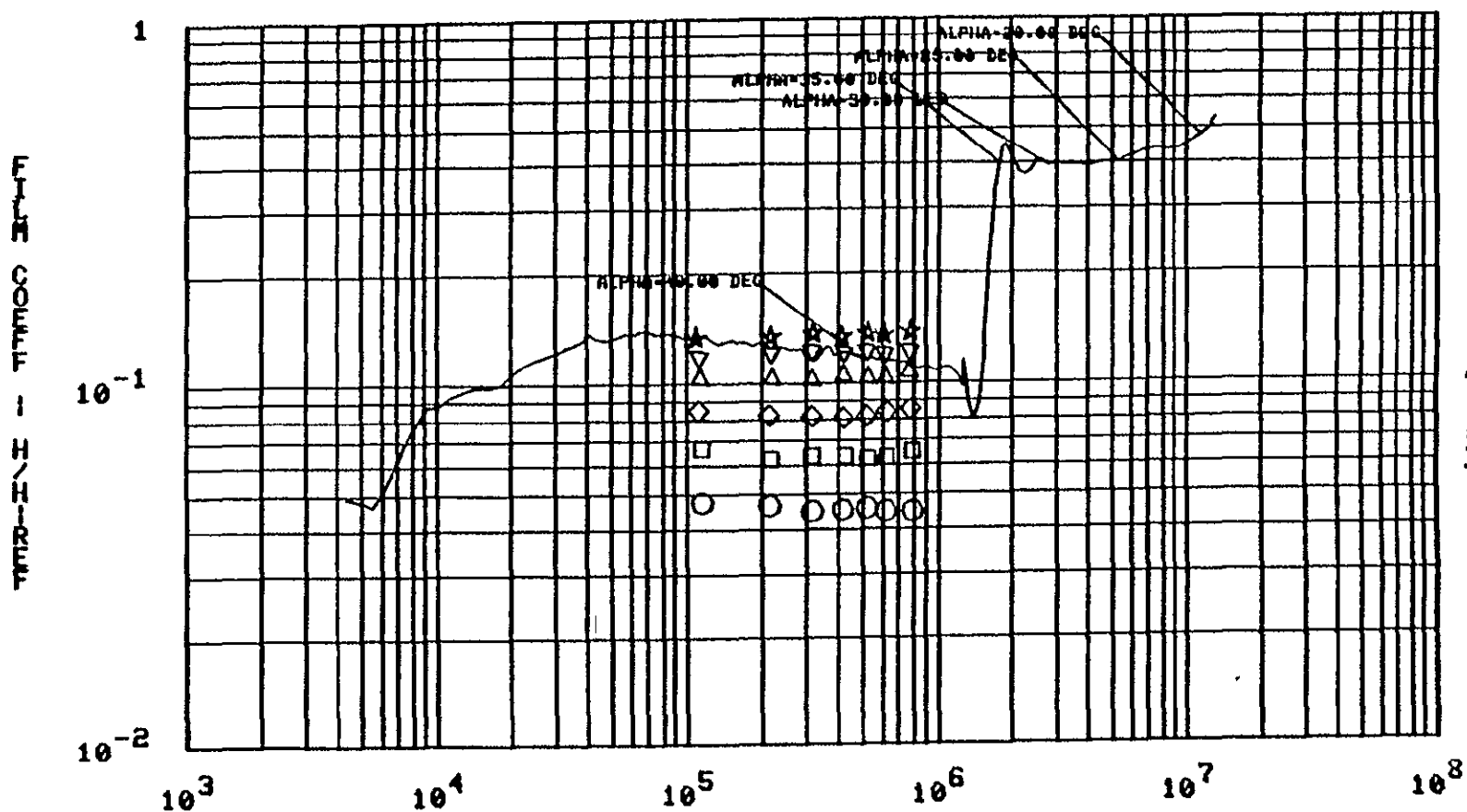
05/02/83  
BASE TIME = 16040423 000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISON

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9471A/H-REF 150-1350 SEC



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OF POOR QUALITY

B-195

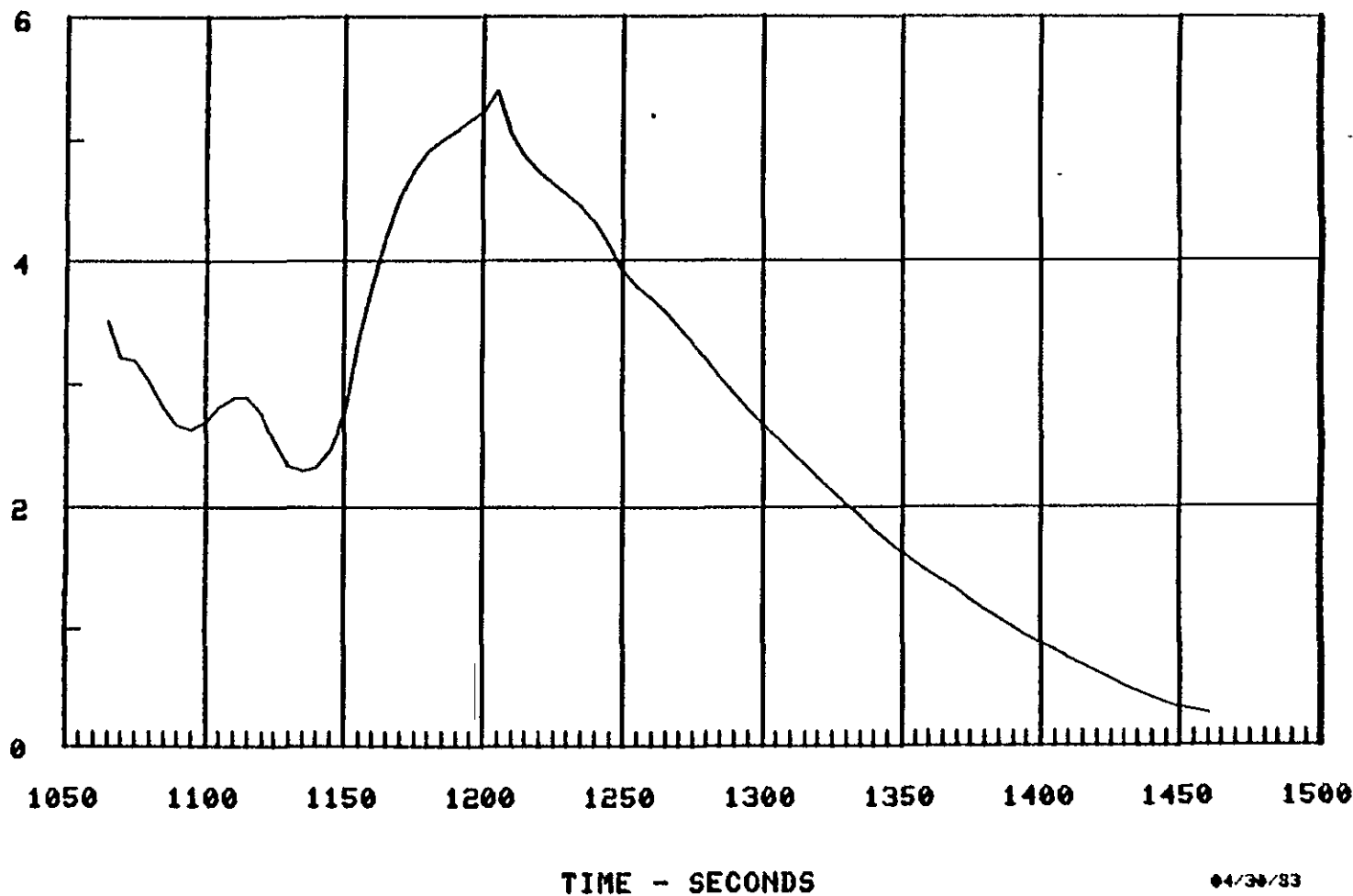
REYNOLDS NUMBER (NS)

04/28/83  
BASE TIME = 27698591.000 SEC.

# STS-1 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A

TIME - SECONDS

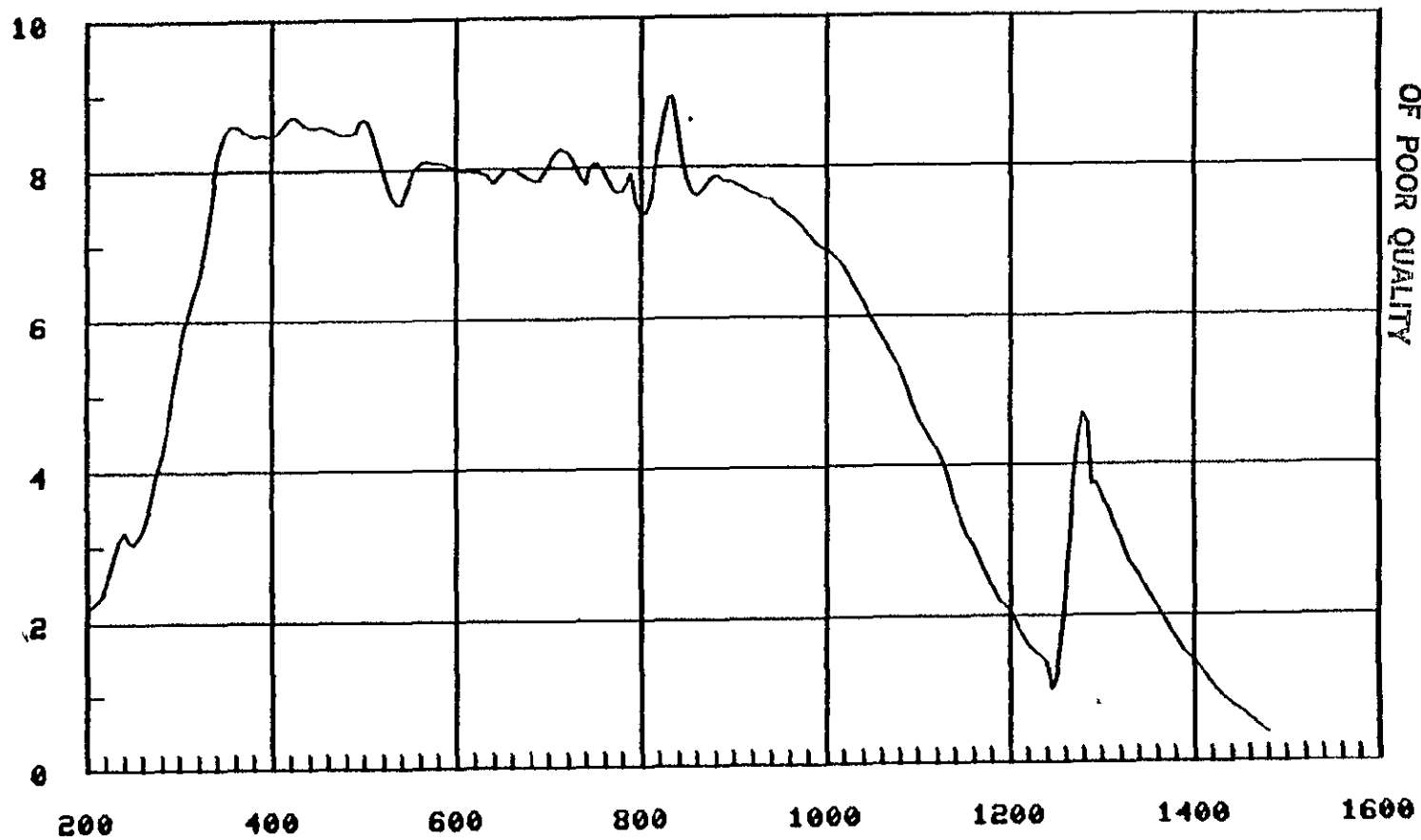


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# STS-2 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A

INTEGRATED ROLL - ROLL/FLIGHT - GYRO



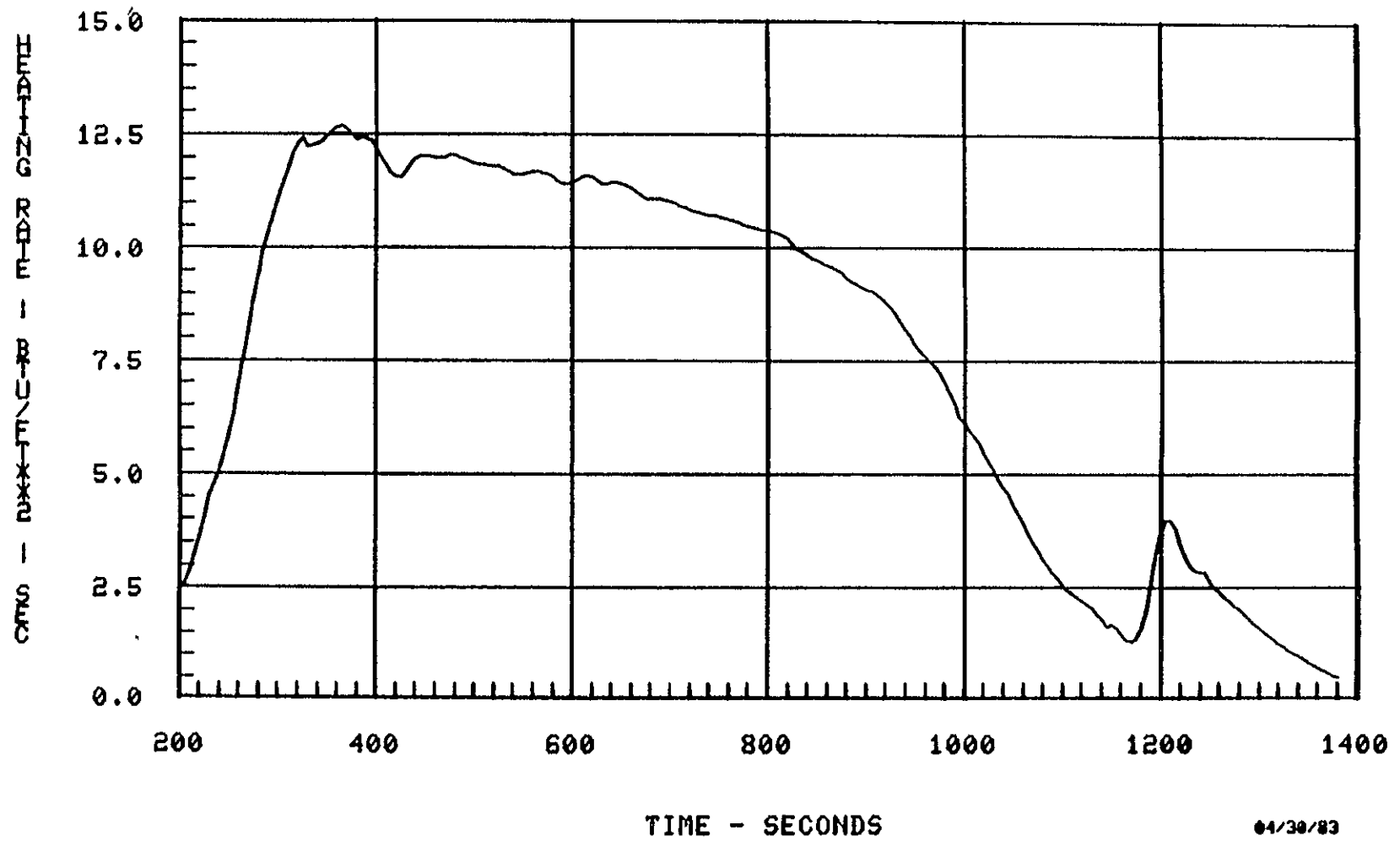
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TIME - SECONDS

04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U87T9471A



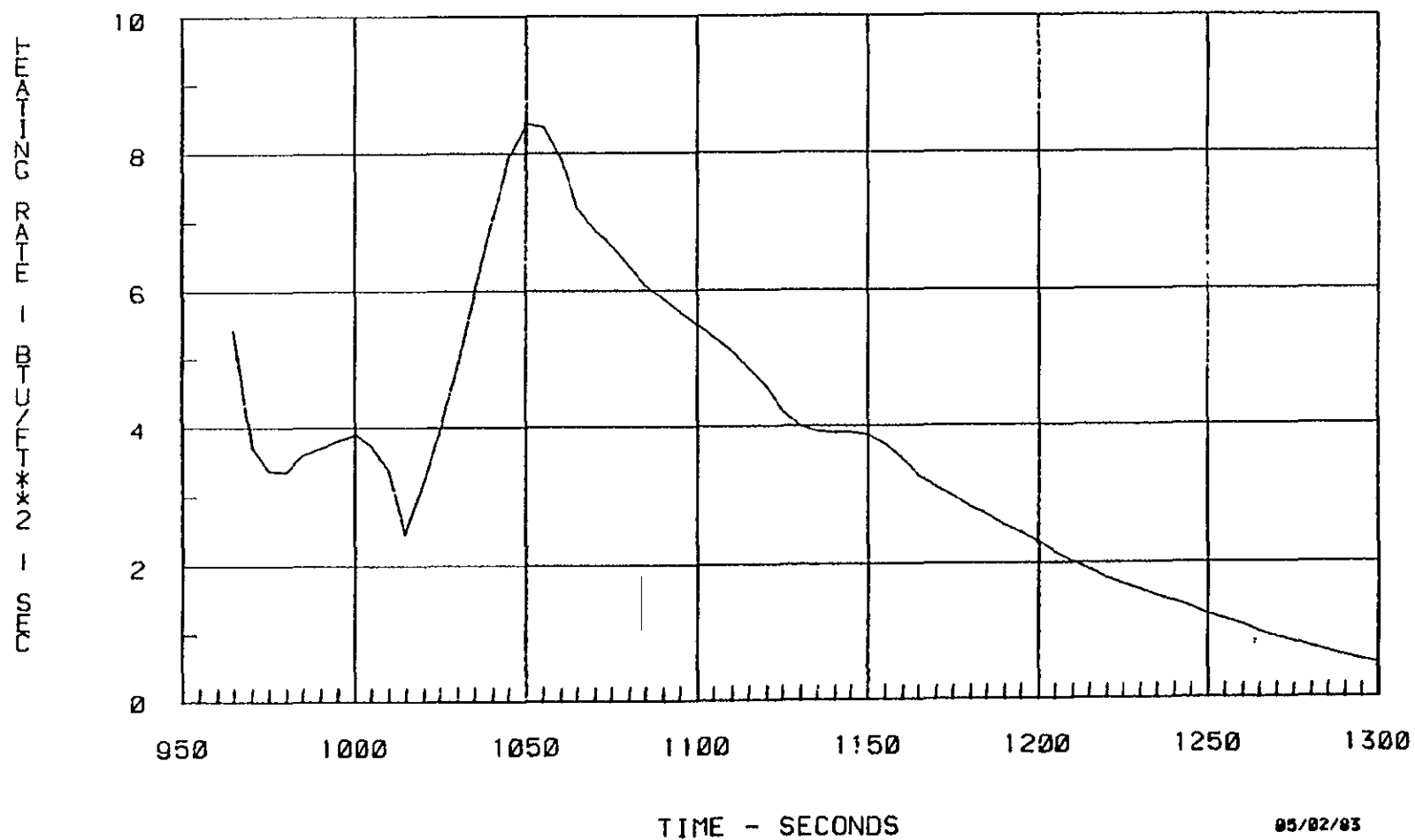
B-198

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04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

V87T9471A



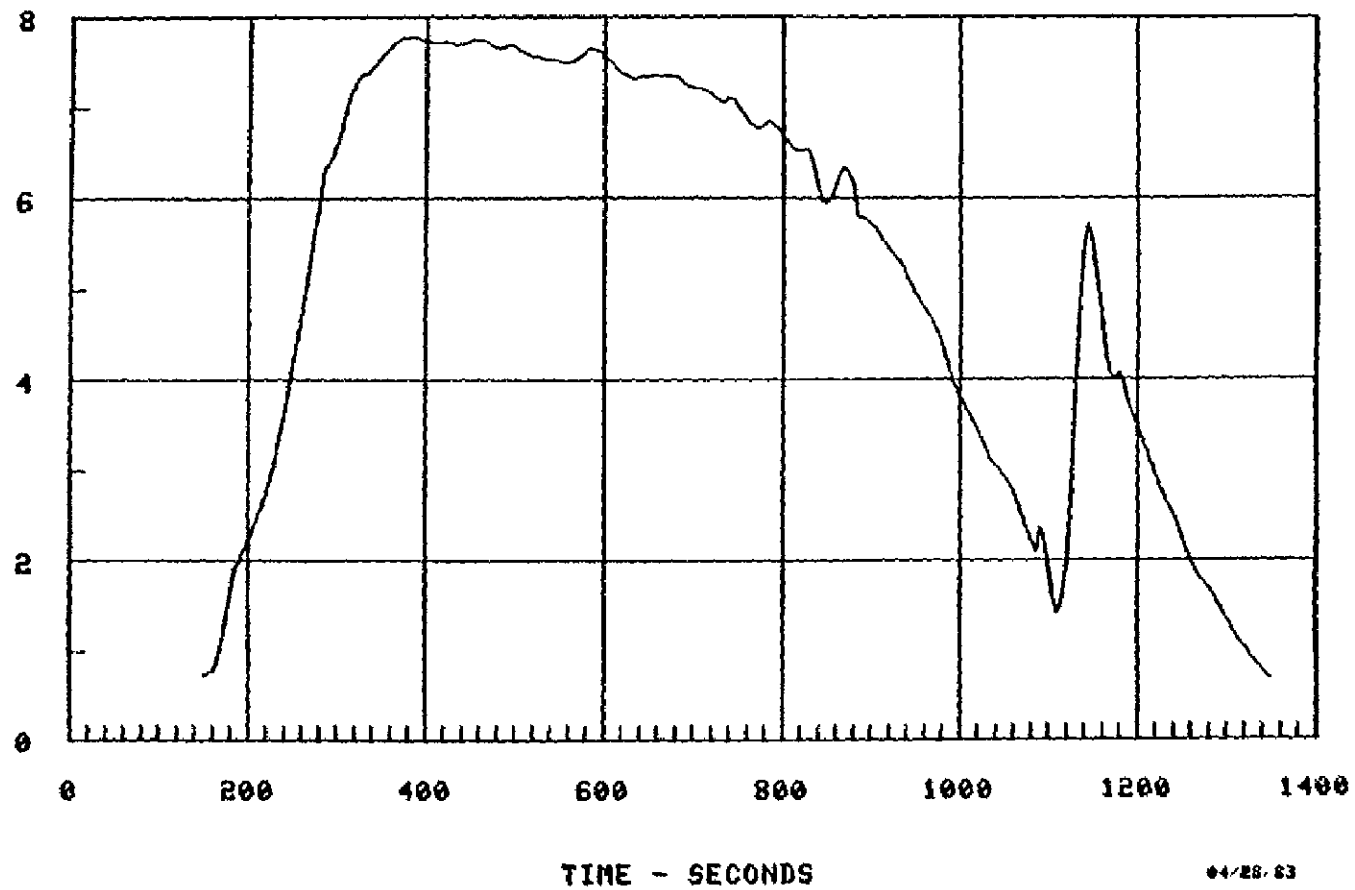
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# STS-5 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A

B-200

HEIGHT - FEET - 1000 - 5000



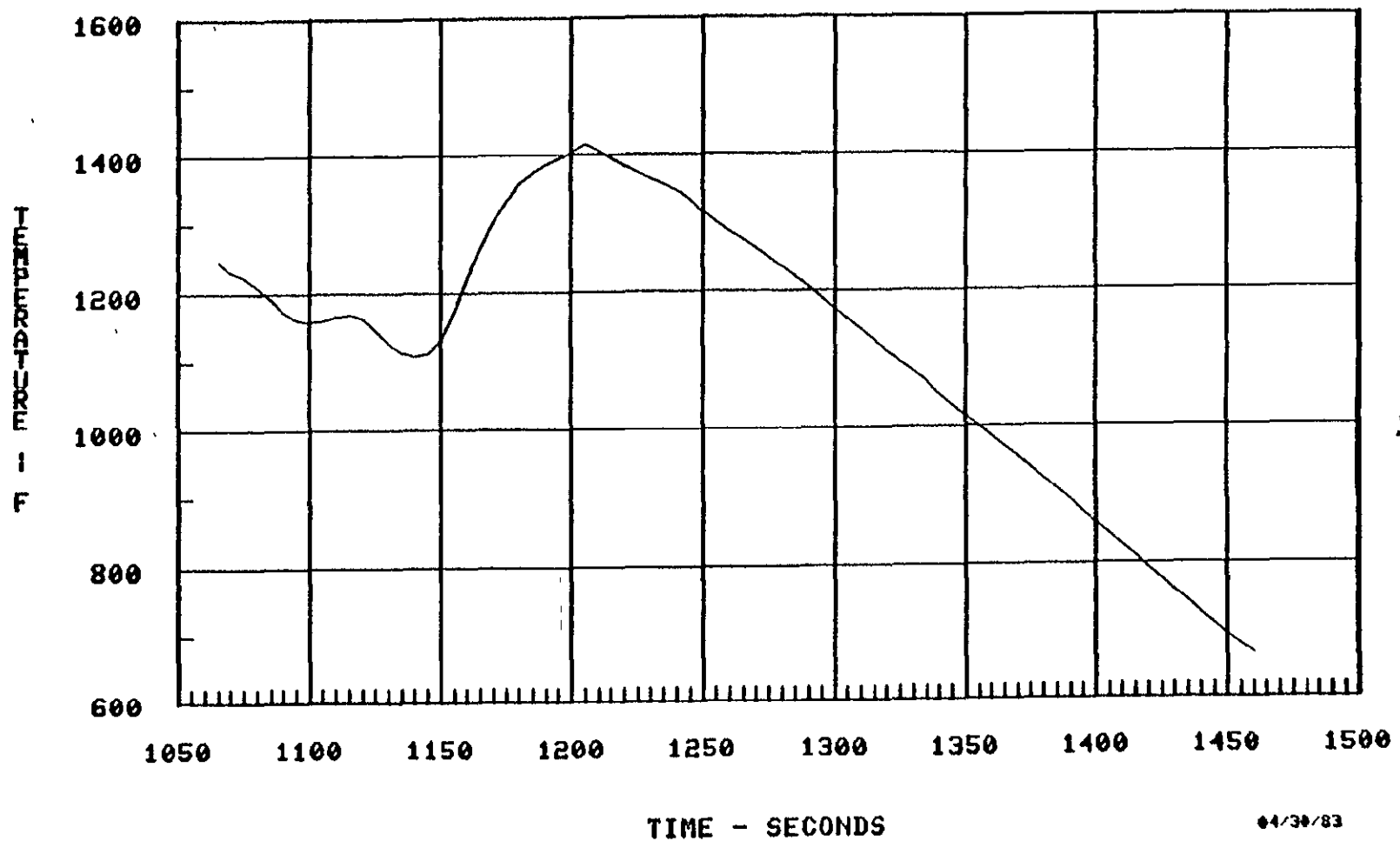
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04/28/83



# STS-1 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISON

U97T9471A



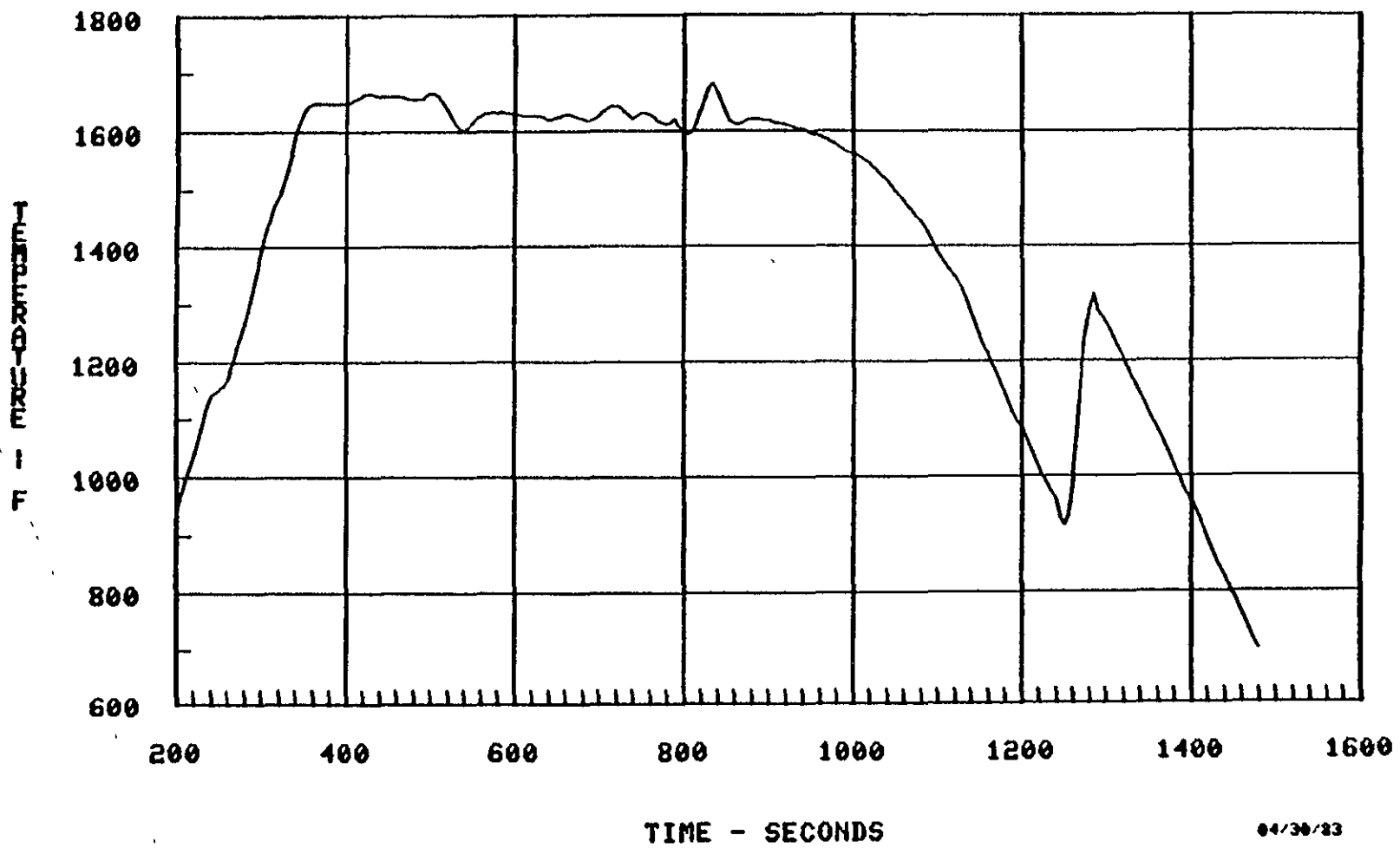
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B-201

04/30/83

## STS-2 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U87T9471A

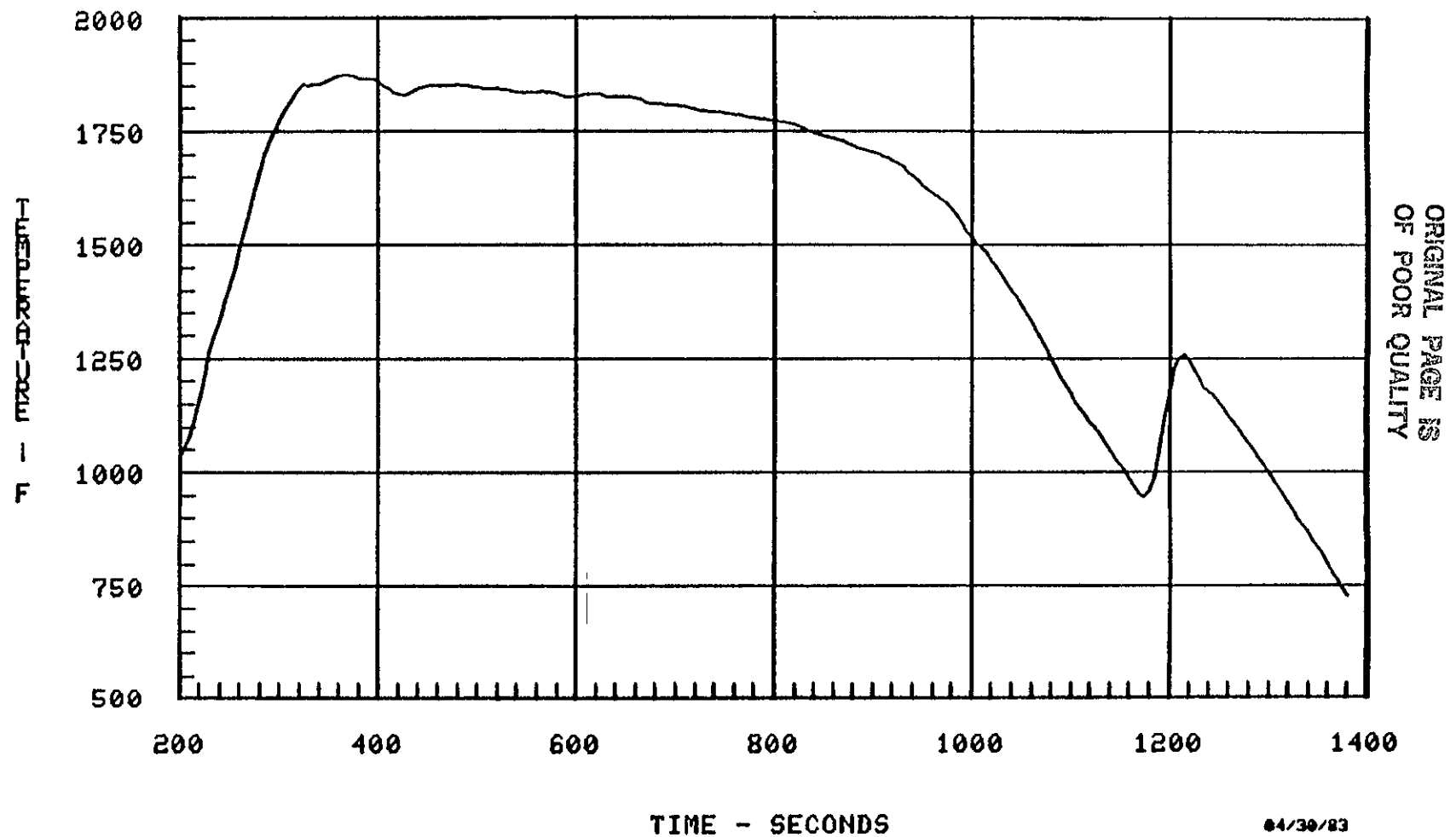


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B-202

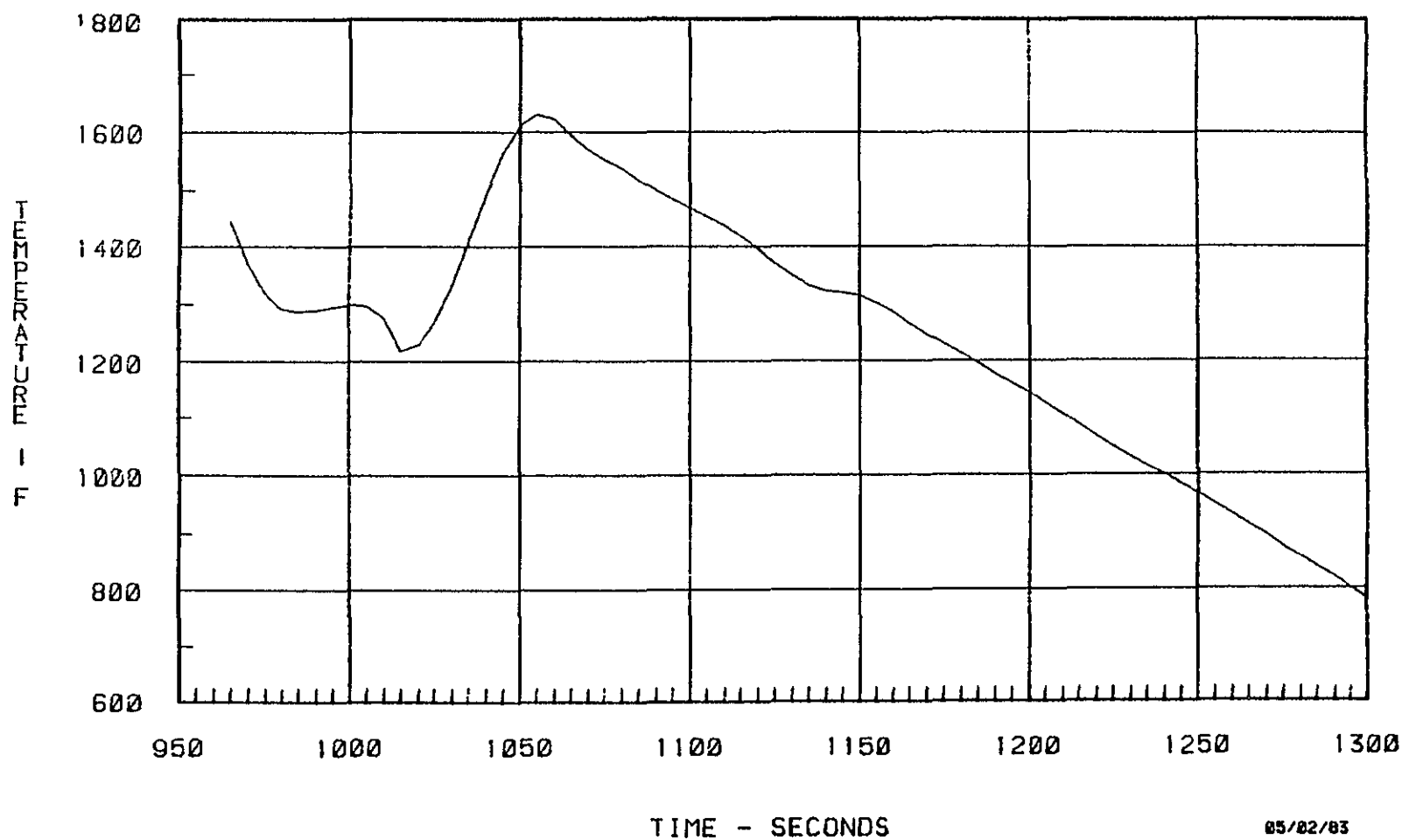
STS-3 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

U07T9471A



# STS-4 (107 FT LENGTH CL X/L=0.40) FLIGHT PARAMETER COMPARISO

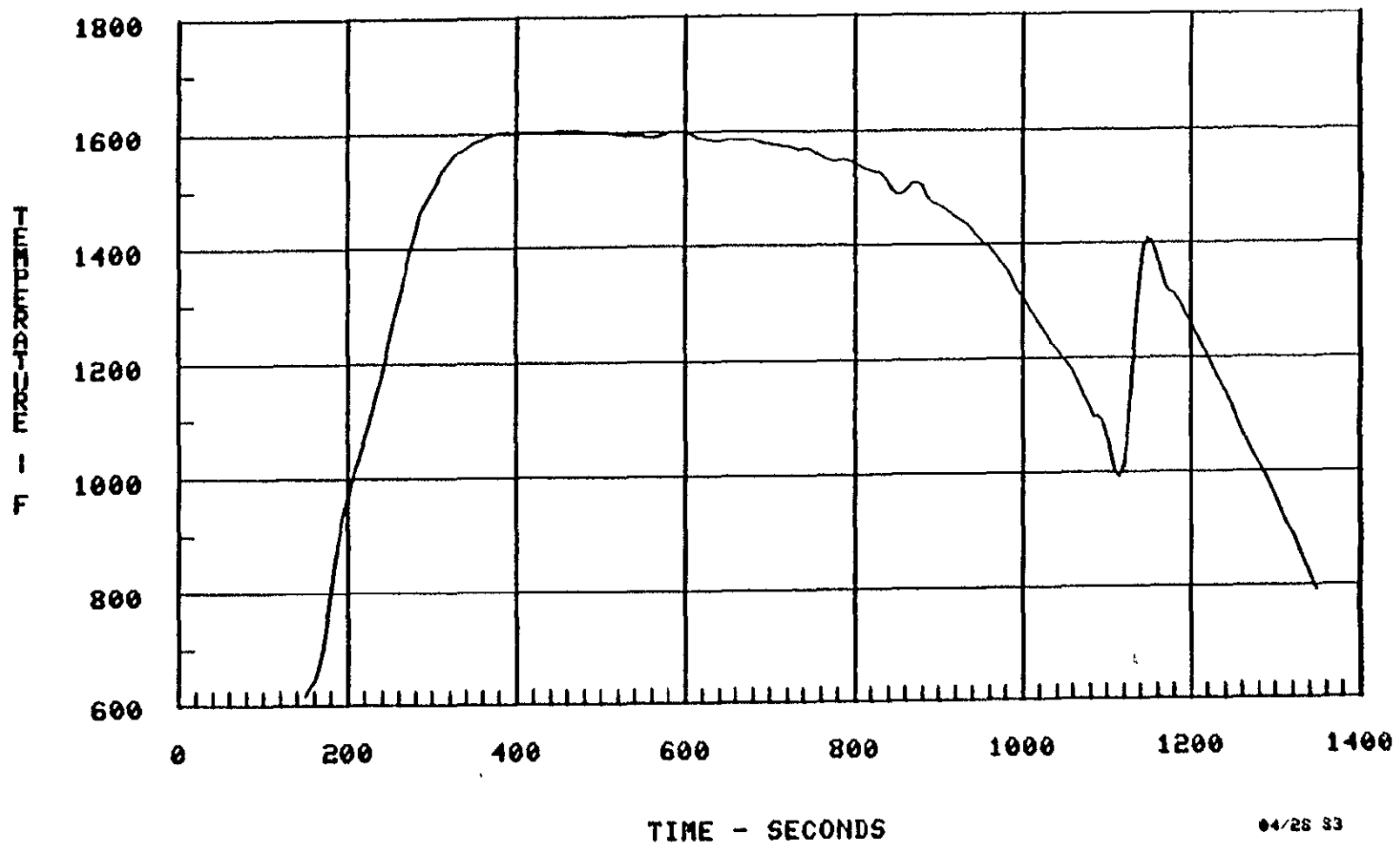
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U07T9471A

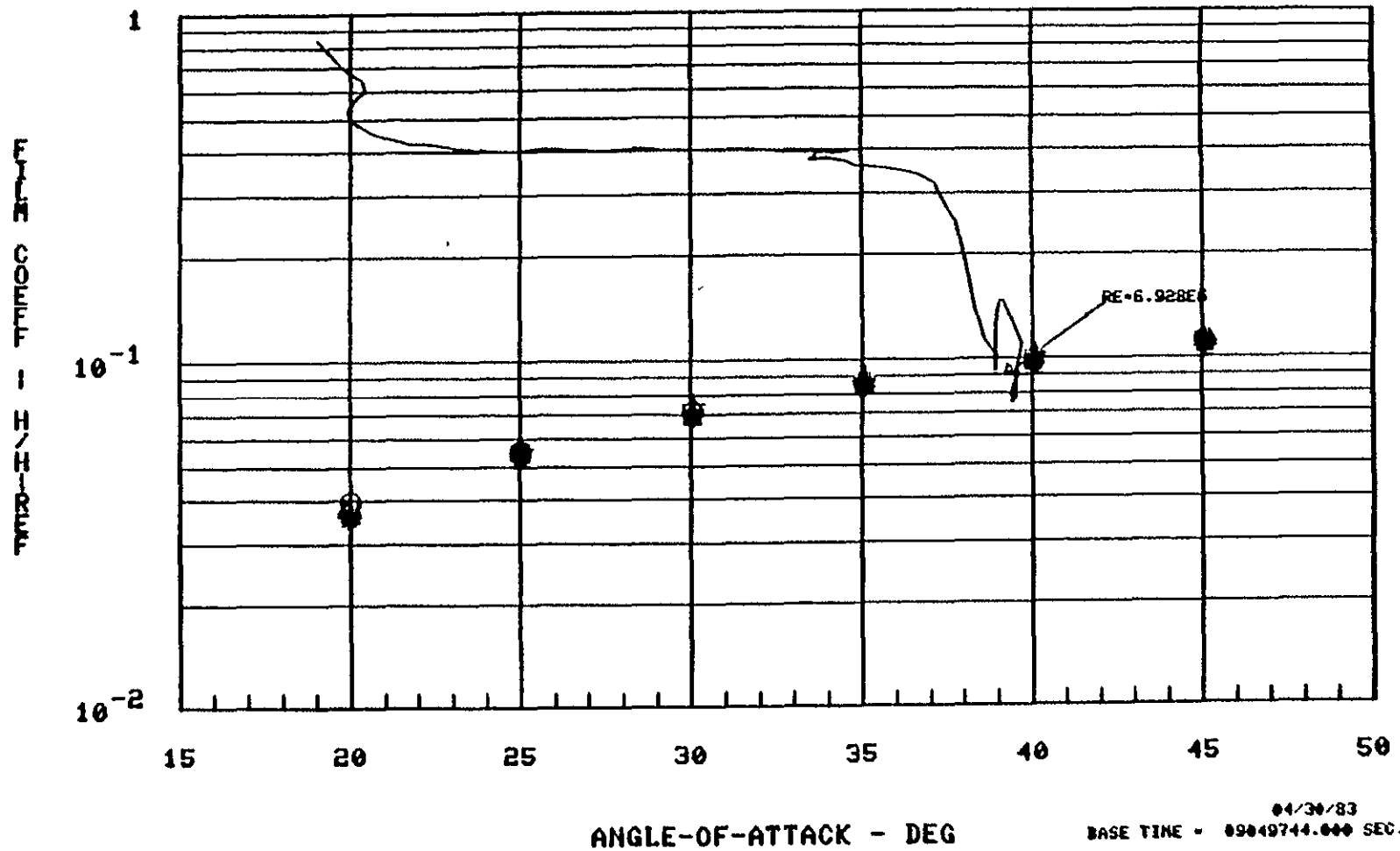


# STS-1 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9521A/H-REF 1065-1460 SEC



B-206

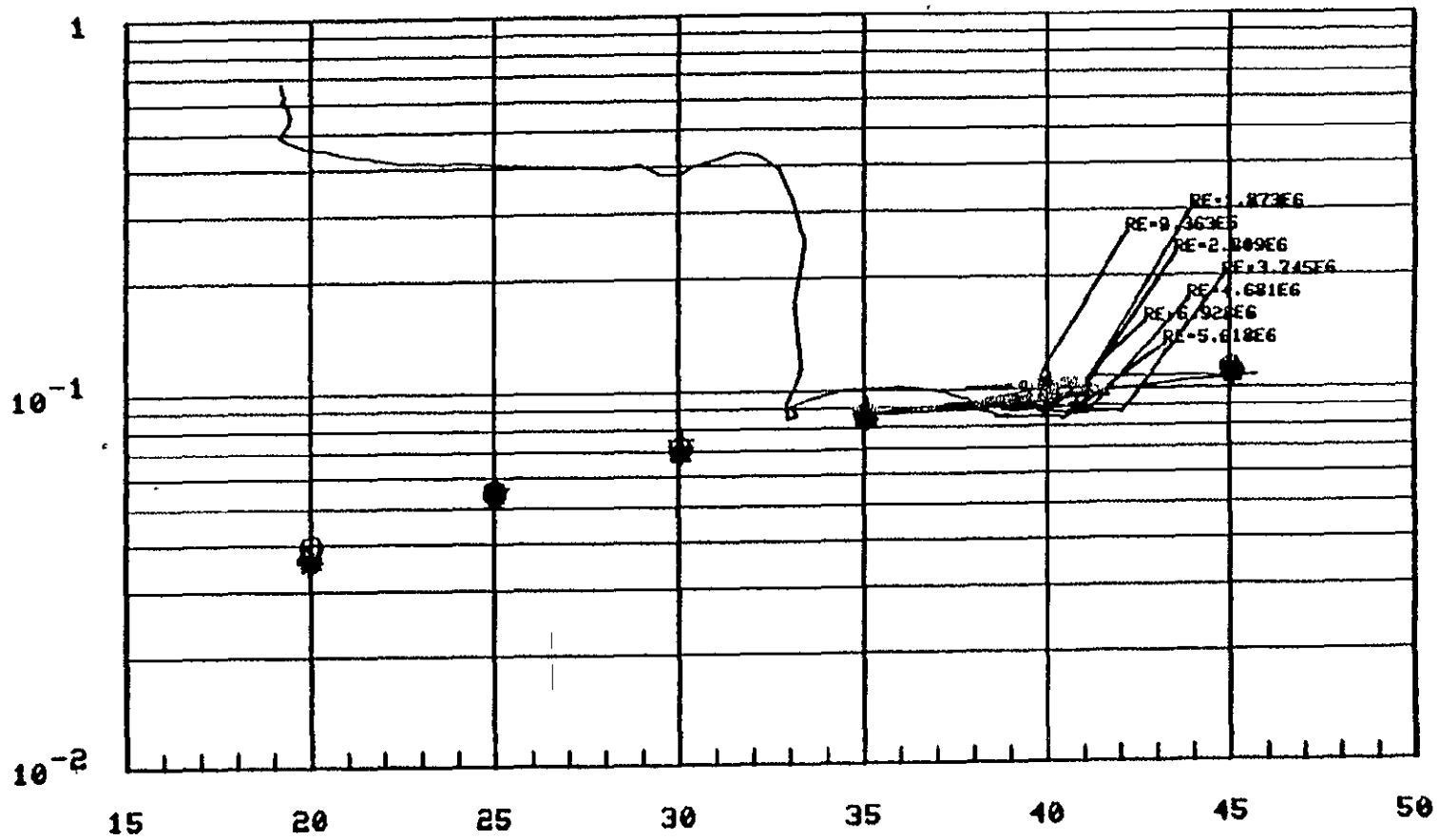
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# STS-2 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9521A/H-REF 200-1480 SEC



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ANGLE-OF-ATTACK - DEG

04/30/83  
BASE TIME = 27550236.000 SEC.

C-27

B-207

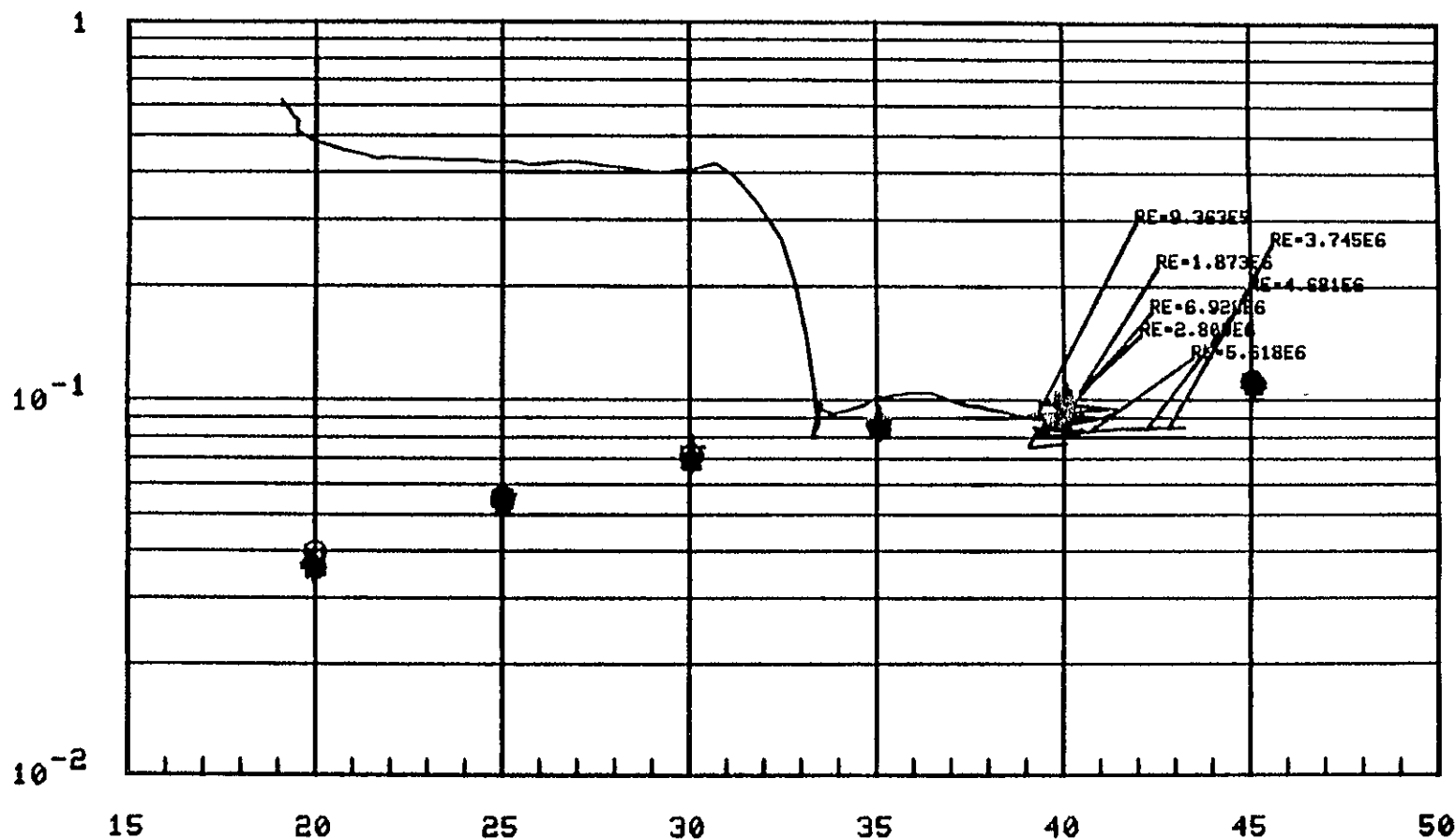
# STS-3 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9521A/H-REF 200-1380 SEC

LINE COUNT - I-I-0000



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ANGLE-OF-ATTACK - DEG

04/30/83  
BASE TIME = 07745684.000 SEC.

B-208

*[Handwritten signature]*



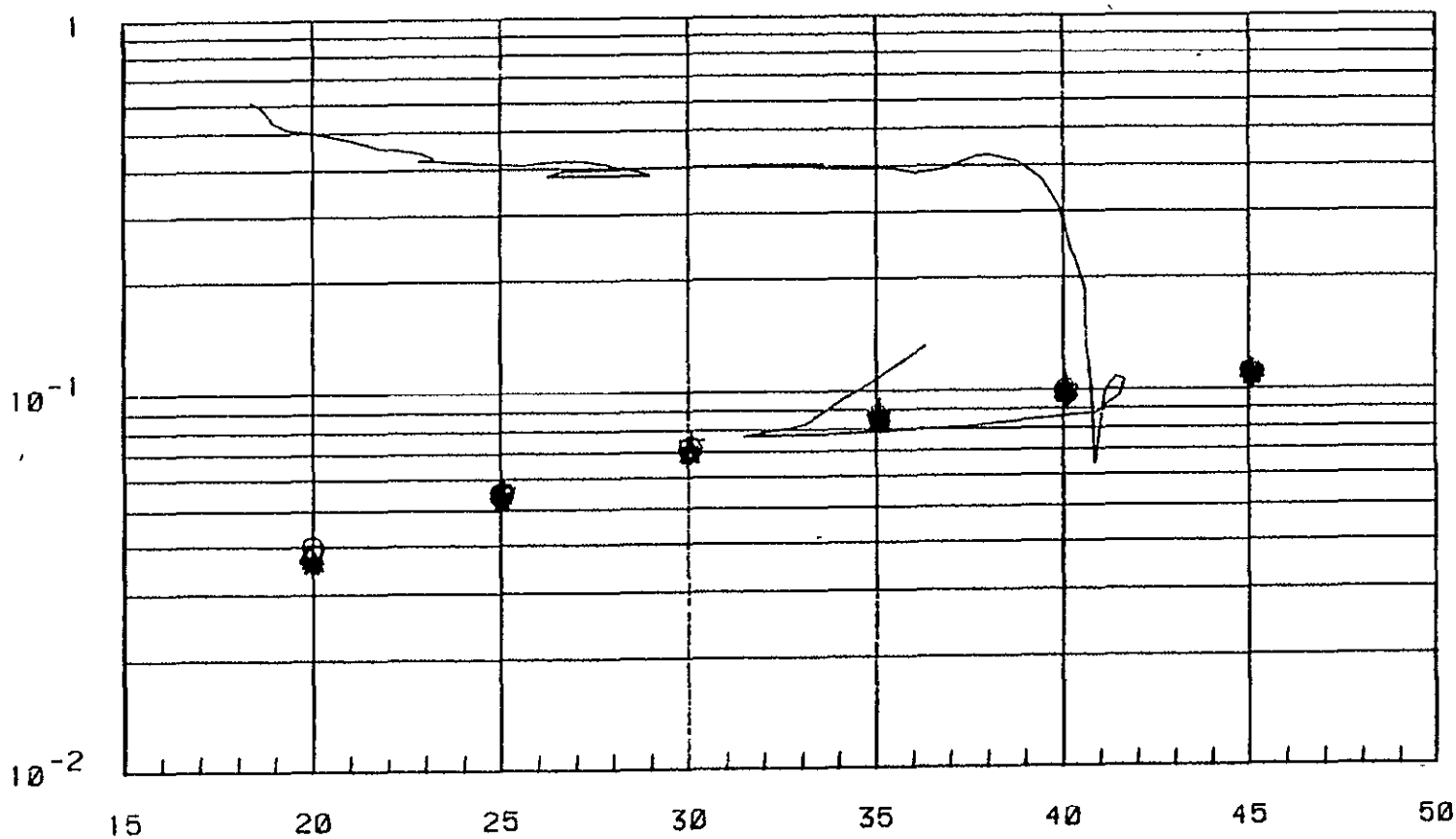
# STS-4 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★  
+

OH40 0.0175 SCALE RE = 0.5 E06  
OH40 0.0175 SCALE RE = 1.0 E06  
OH40 0.0175 SCALE RE = 1.5 E06  
OH40 0.0175 SCALE RE = 2.0 E06  
OH40 0.0175 SCALE RE = 2.5 E06  
OH40 0.0175 SCALE RE = 3.0 E06  
OH40 0.0175 SCALE RE = 3.7 E06

V09T0521A/H-REF 965-1300 SEC

FLIGHT COEFFICIENT - INTERPOLATED



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ANGLE-OF-ATTACK - DEG

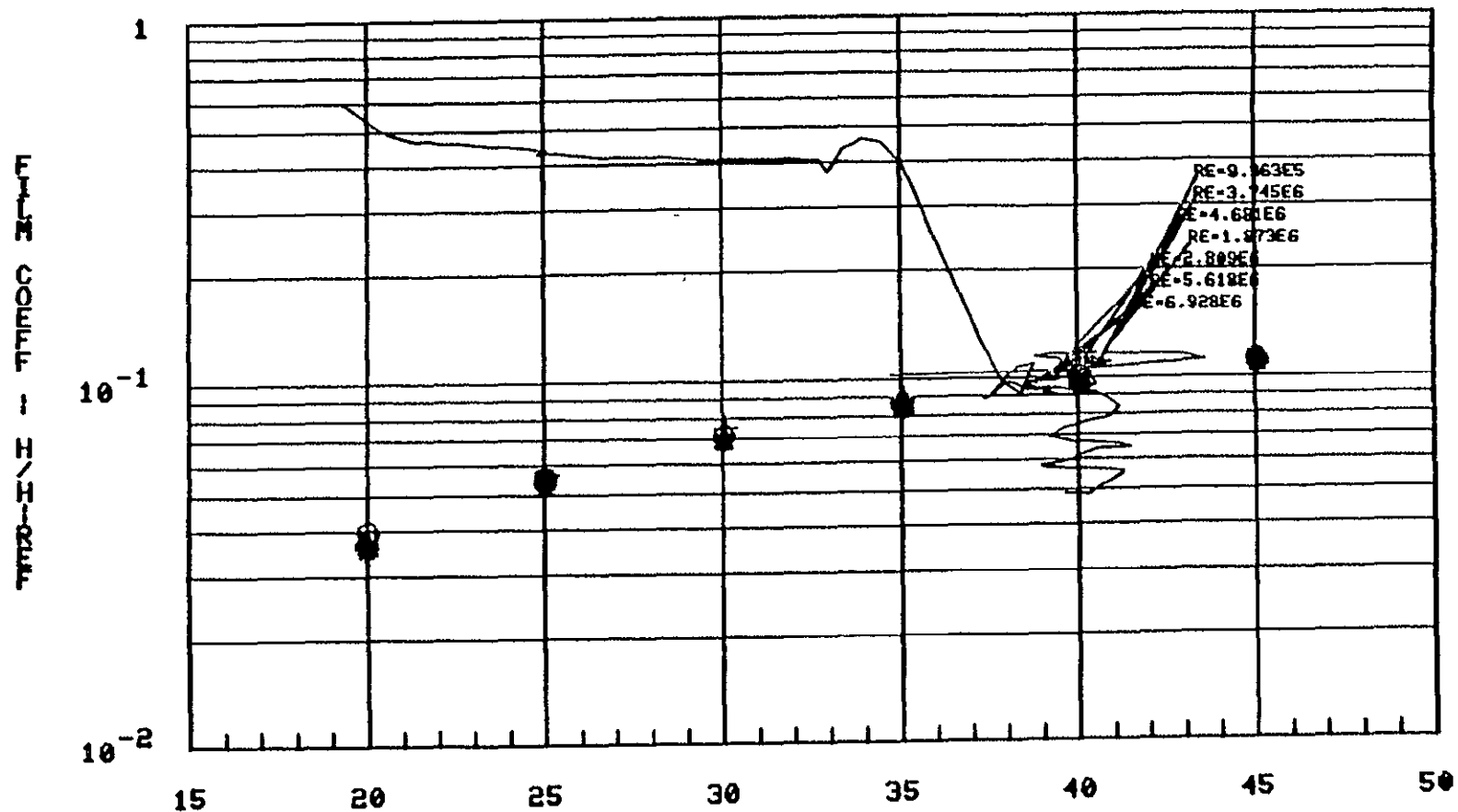
05/02/83  
BASE TIME = 16040423.000 SEC.

# ST6-5 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
+  
+

0H49 0.0175 SCALE RE = 0.5 E06  
 0H49 0.0175 SCALE RE = 1.0 E06  
 0H49 0.0175 SCALE RE = 1.5 E06  
 0H49 0.0175 SCALE RE = 2.0 E06  
 0H49 0.0175 SCALE RE = 2.5 E06  
 0H49 0.0175 SCALE RE = 3.0 E06  
 0H49 0.0175 SCALE RE = 3.7 E06

U09T9521A/H-REF 150-1350 SEC



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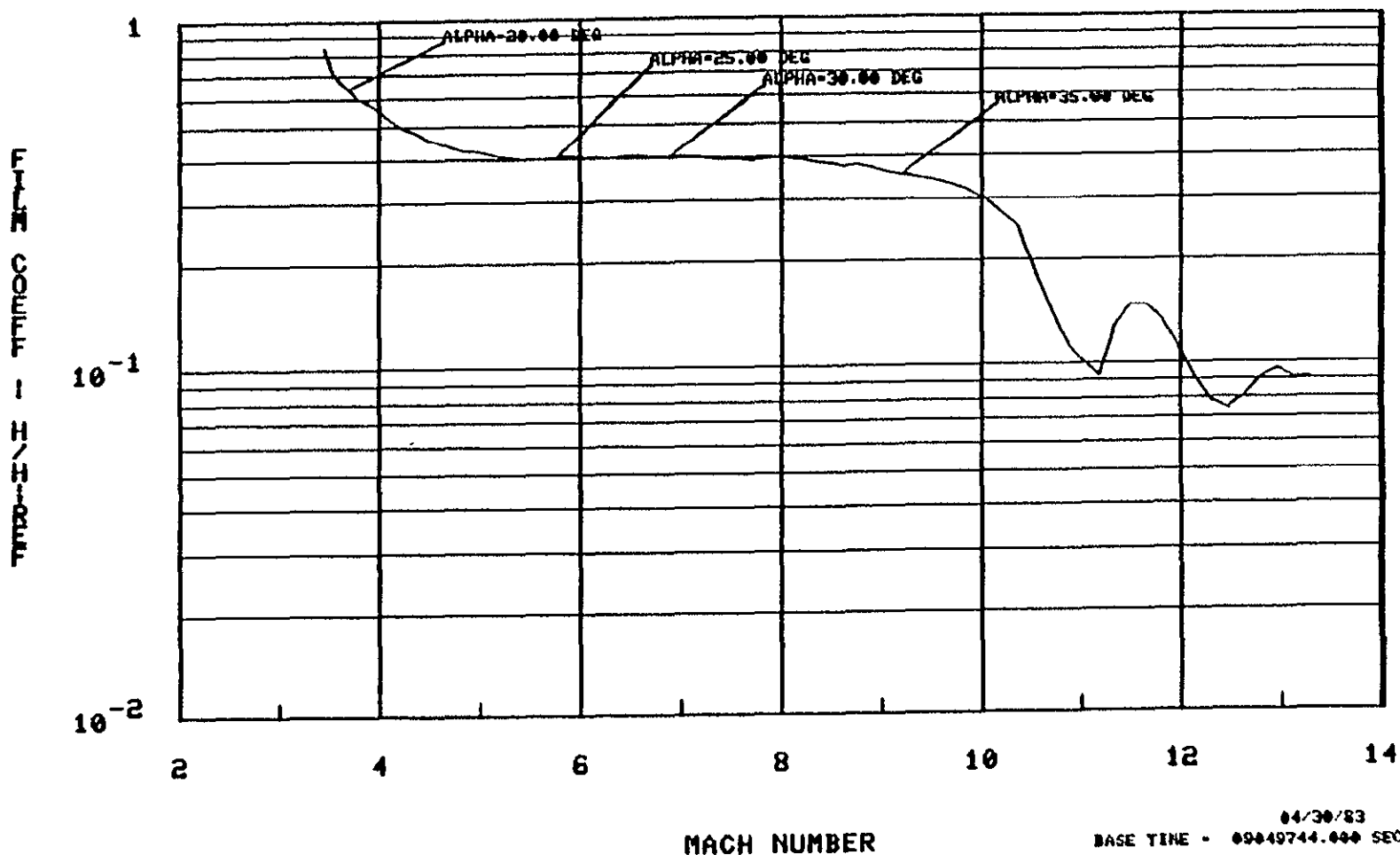
3-210

ANGLE-OF-ATTACK - DEG

04/28/83  
BASE TIME = 27696591.000 SEC.

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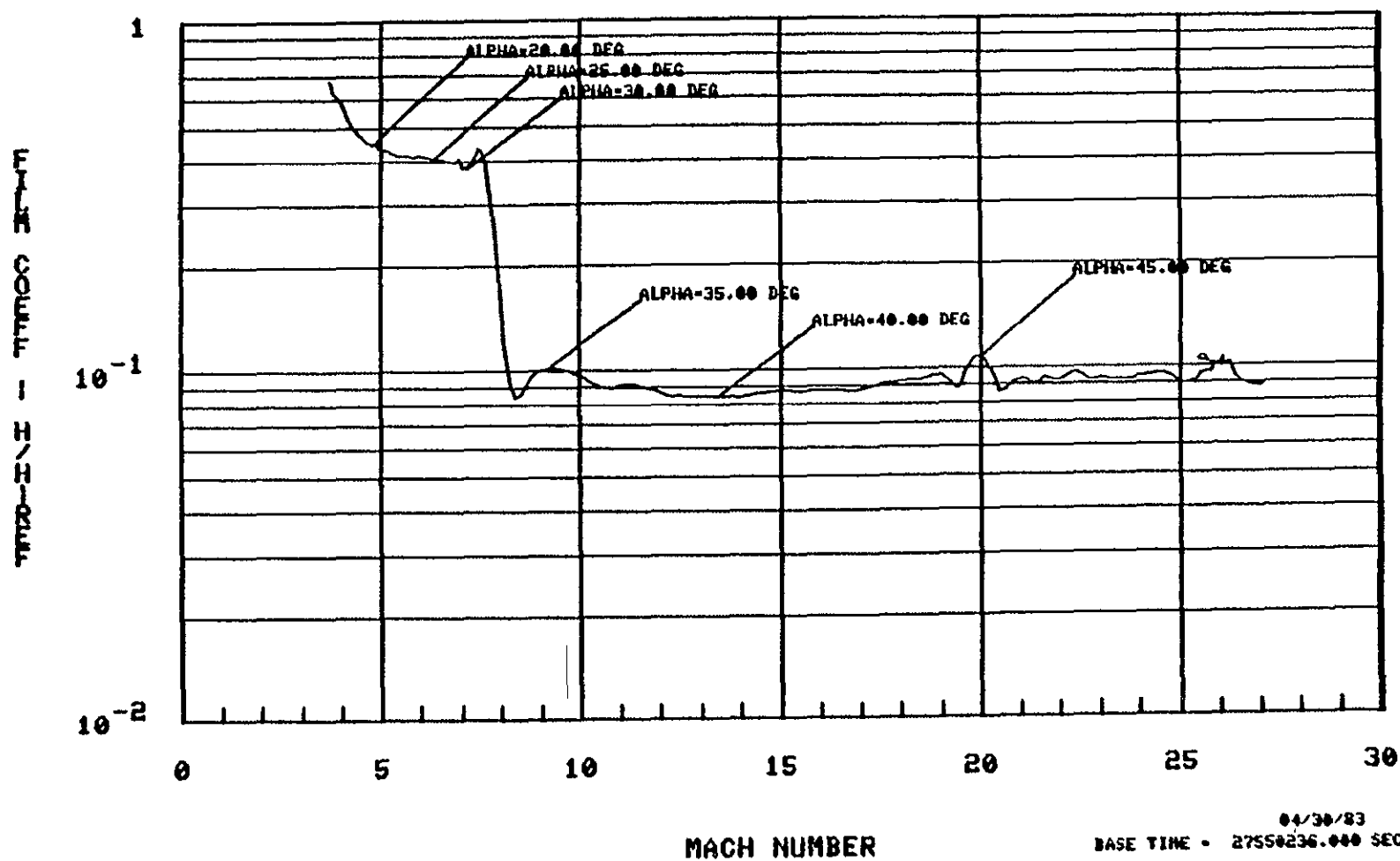
U09T9521A/H-REF 1065-1460 SEC



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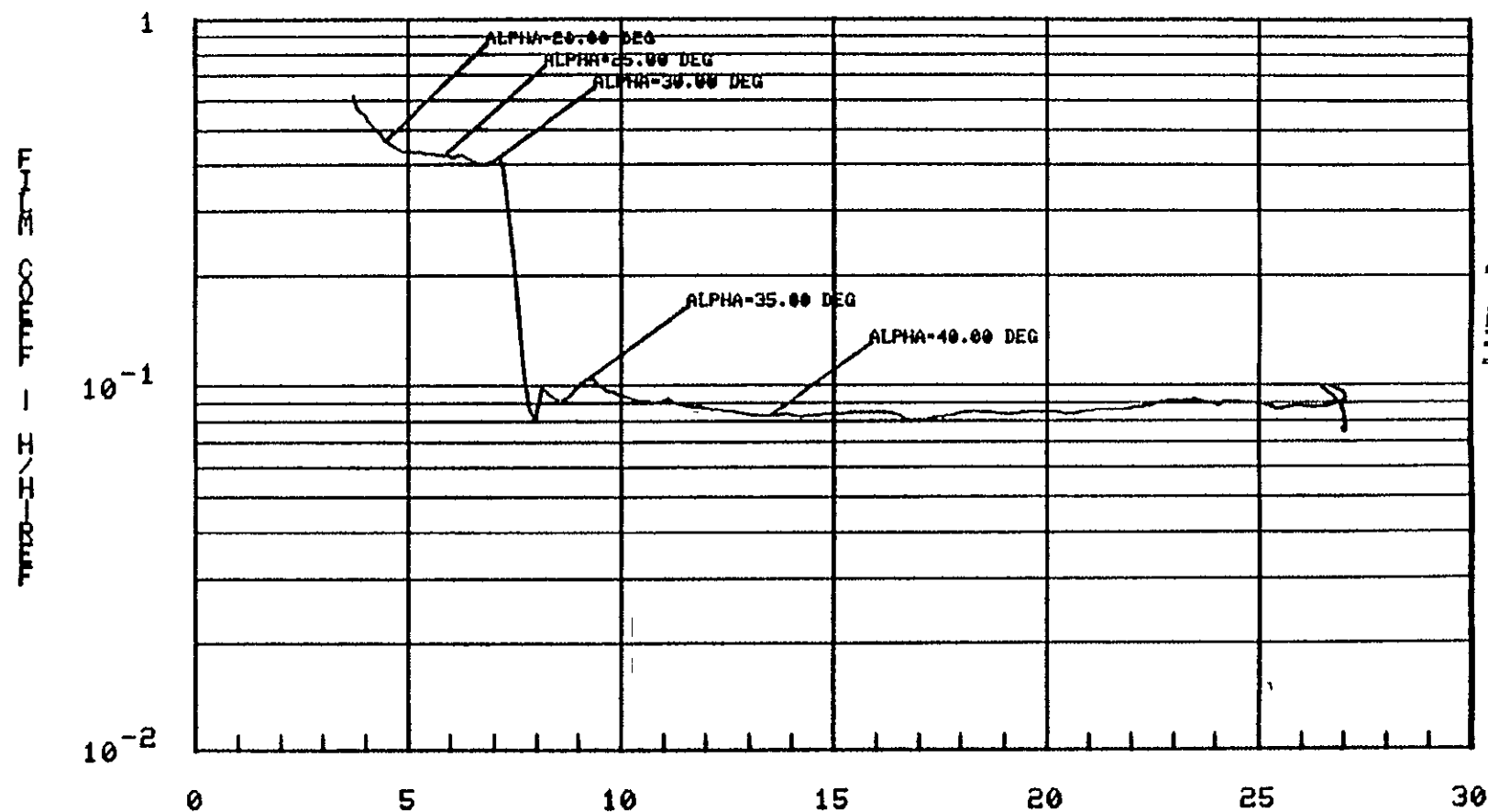
U09T9521A/H-REF 200-1480 SEC



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U09T9521A/H-REF 200-1380 SEC



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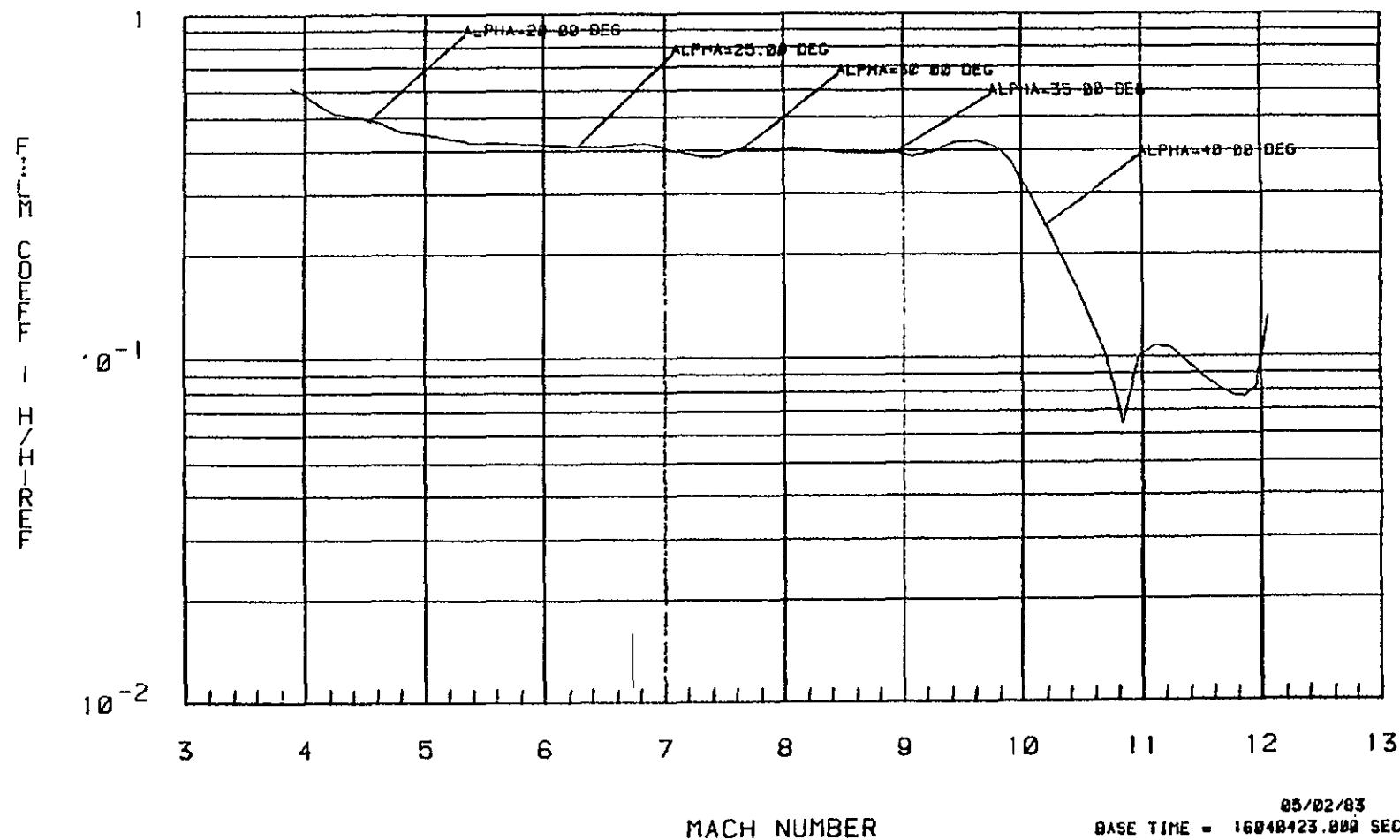
B-213

MACH NUMBER

04/30/83  
BASE TIME • 07745684.000 SEC.

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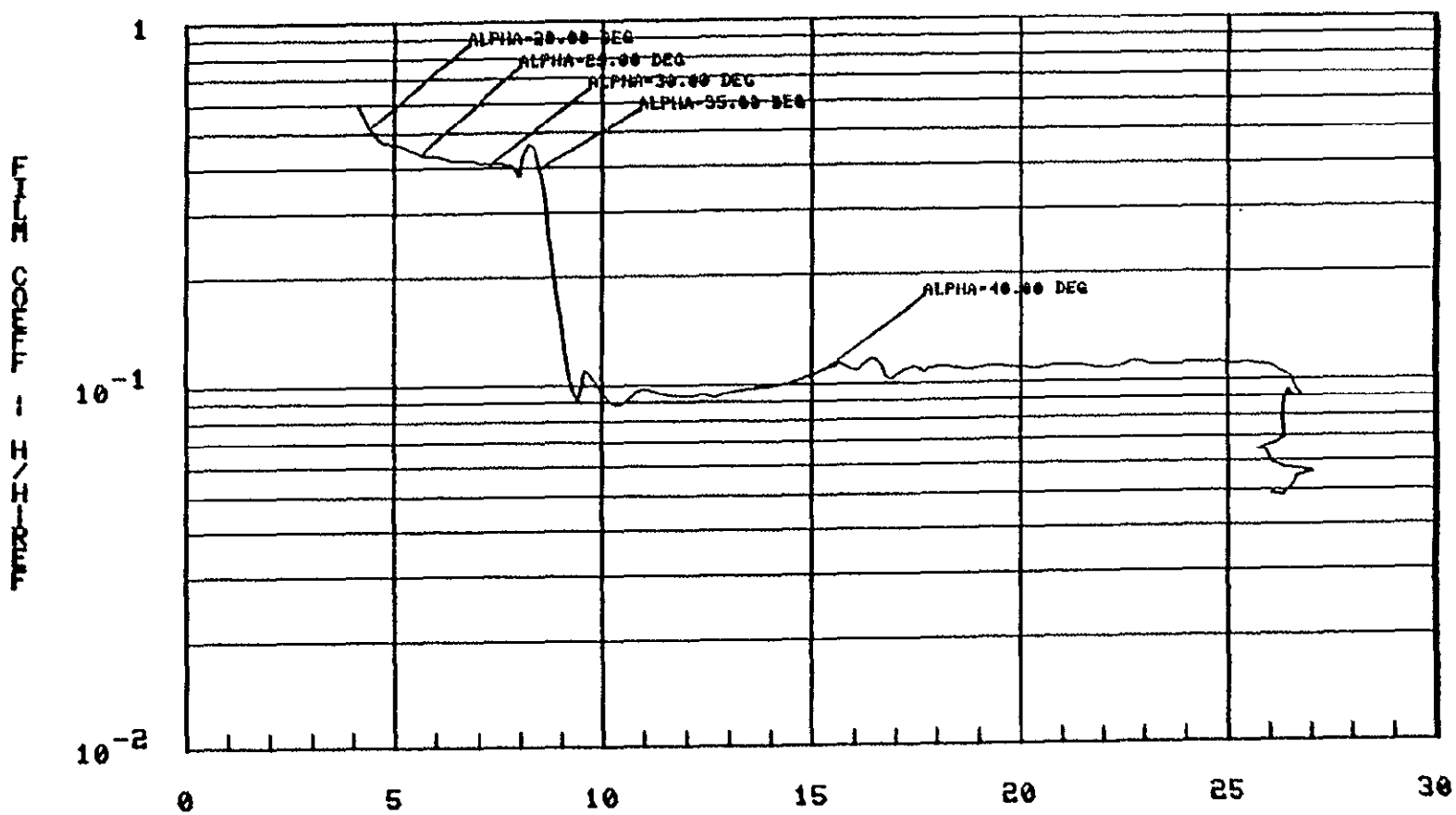
V00T0521A/H-REF 065-1300 SEC



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# STS-5 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

U09T9521A/H-REF 150-1350 SEC



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QUALITY

B-215

MACH NUMBER

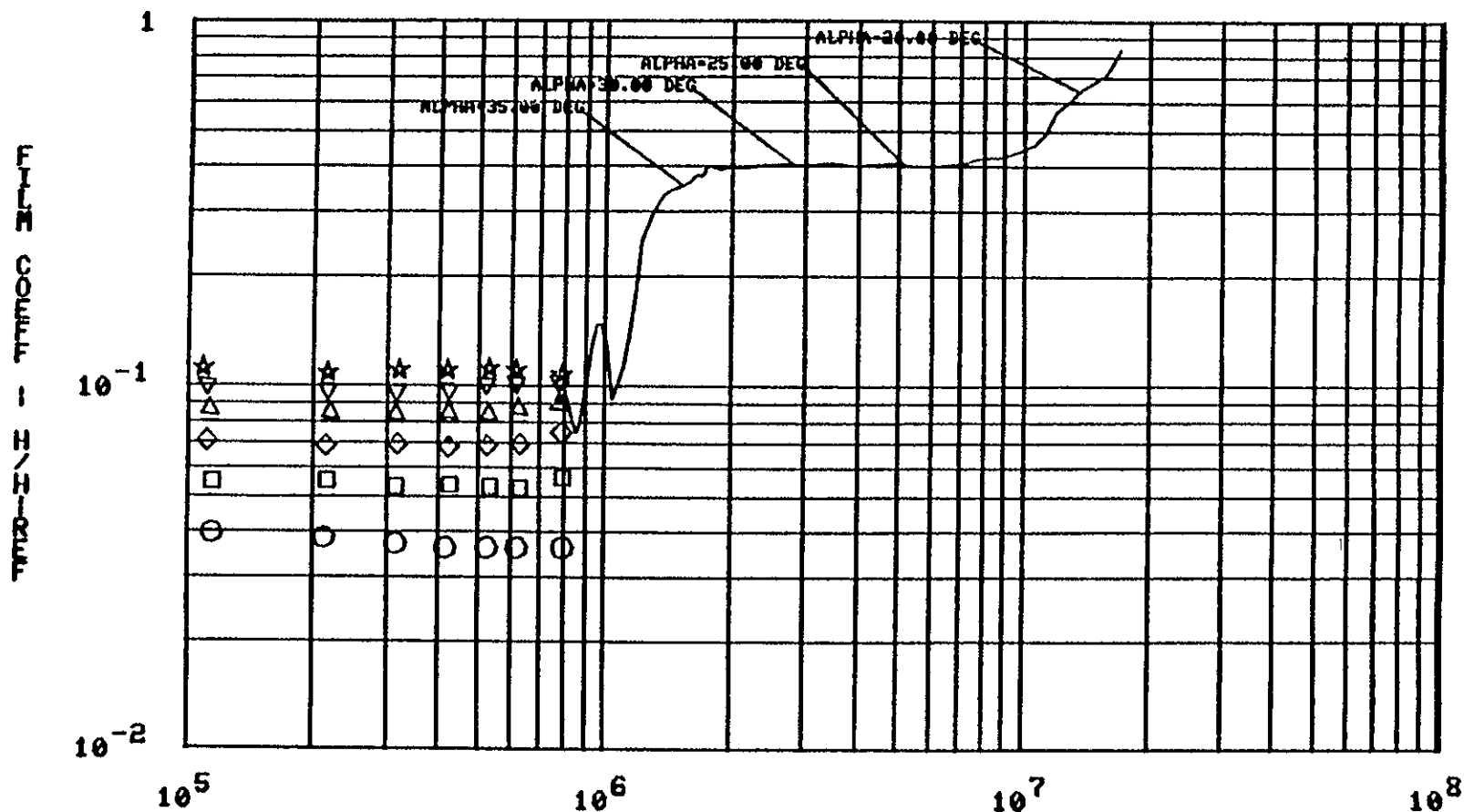
04/28/83  
BASE TIME = 27698591.000 SEC.

# STS-1 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9521A/H-REF 1065-1460 SEC



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04/30/83  
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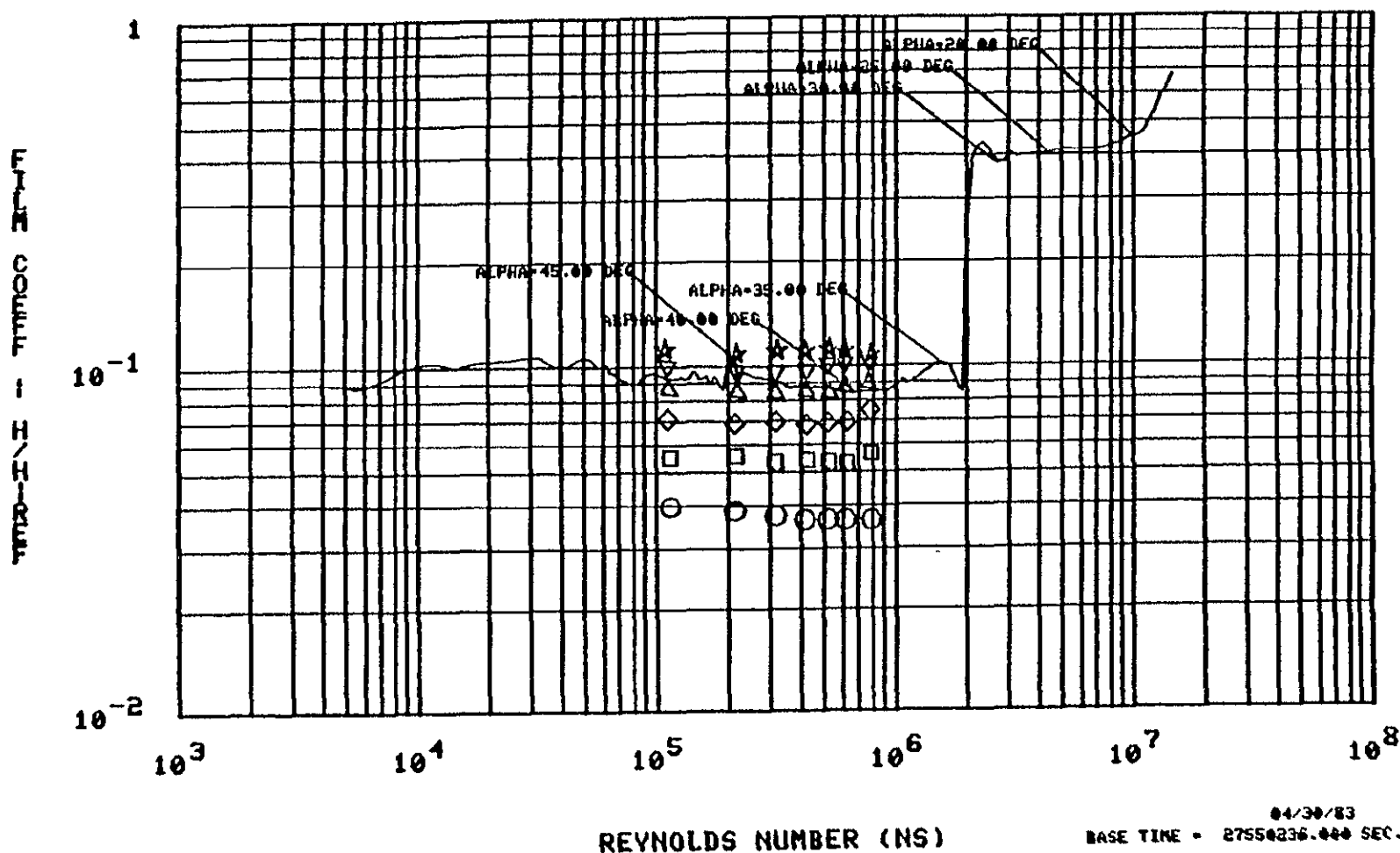


# STS-2 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9521A/H-REF 200-1480 SEC



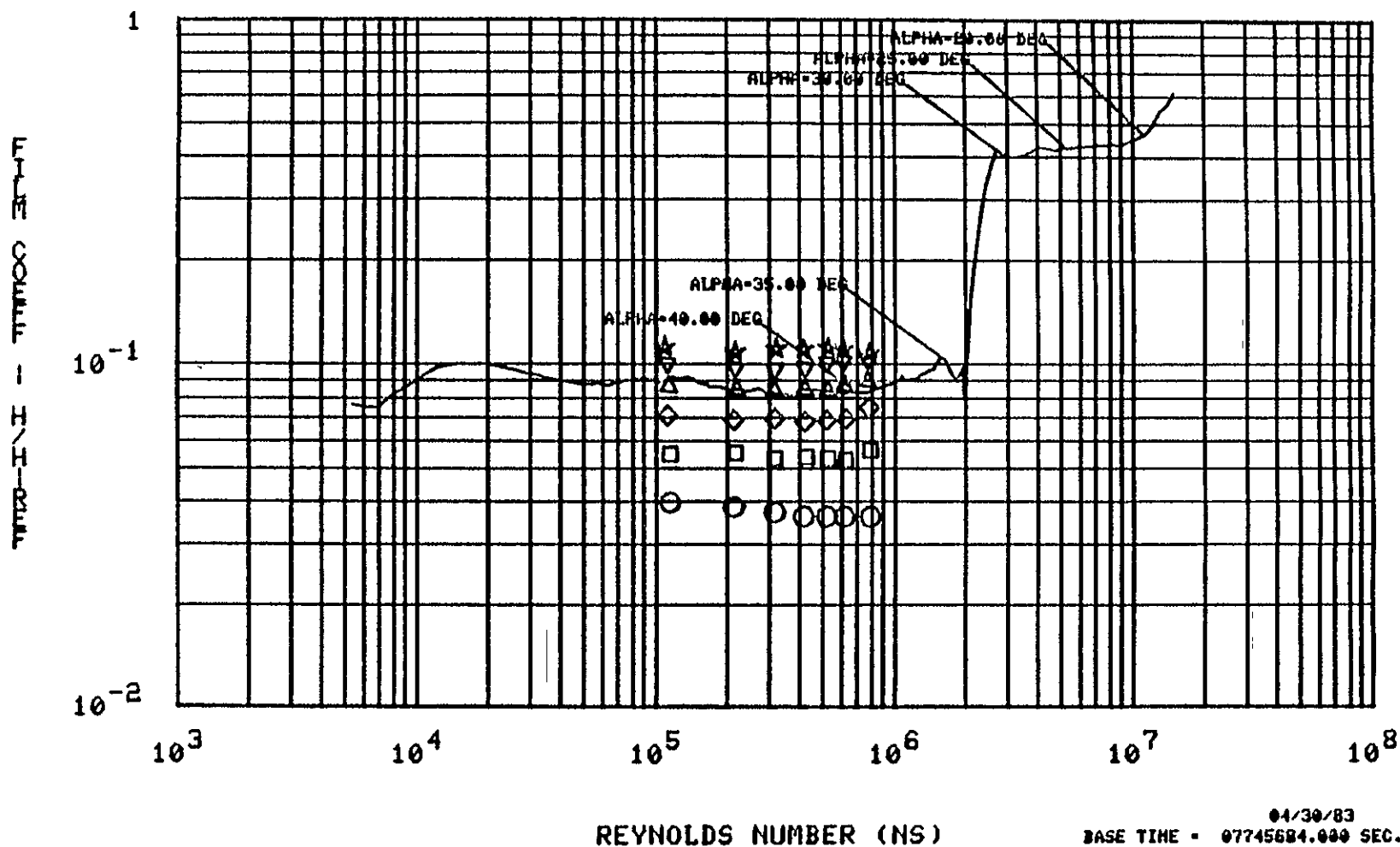
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# STS-3 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★

OH49 ALPHA • 20 DEGREES  
OH49 ALPHA • 25 DEGREES  
OH49 ALPHA • 30 DEGREES  
OH49 ALPHA • 35 DEGREES  
OH49 ALPHA • 40 DEGREES  
OH49 ALPHA • 45 DEGREES

U09T9521A/H-REF 200-1380 SEC



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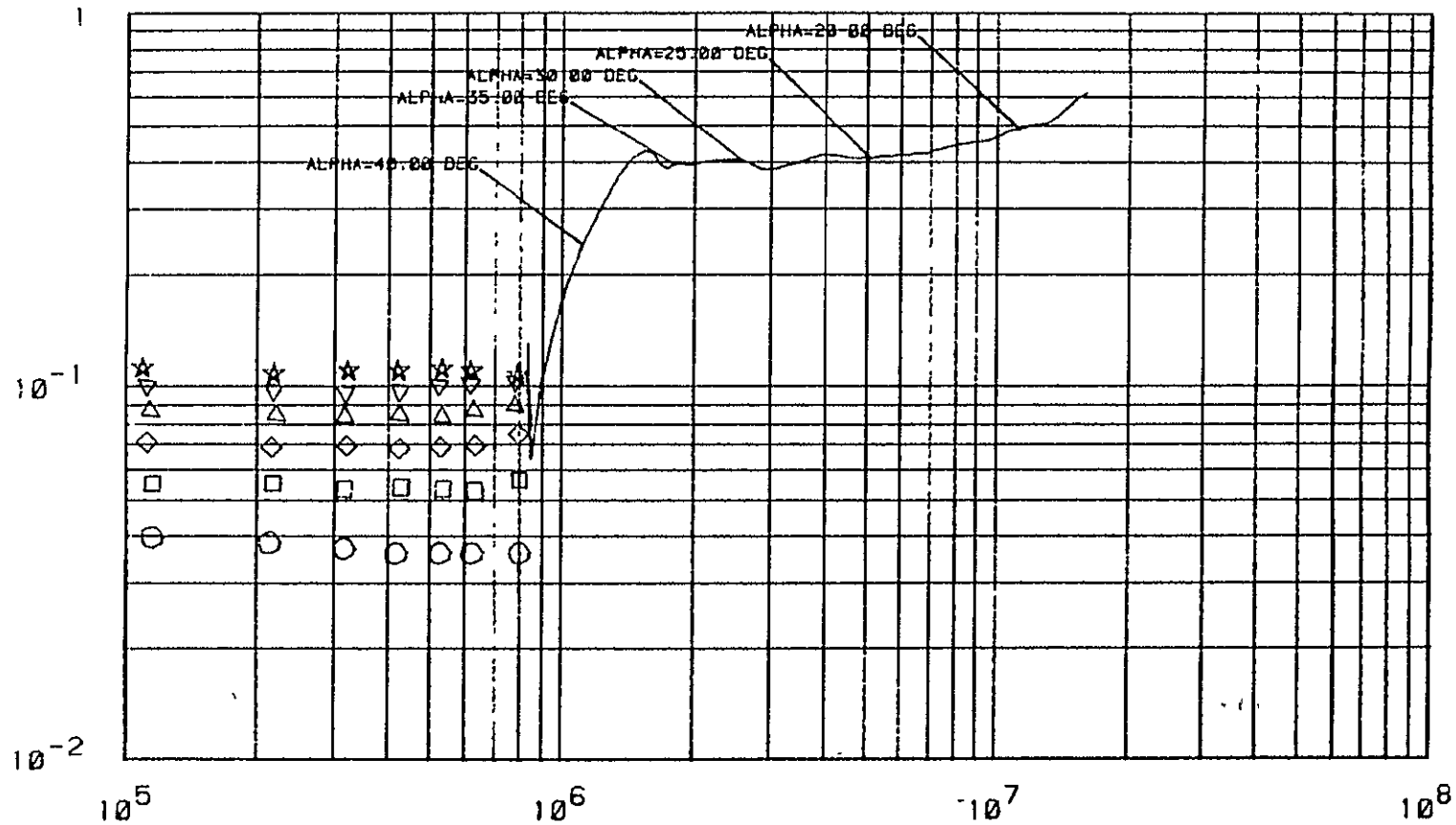
# STS-4 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH40 ALPHA = 20 DEGREES  
OH40 ALPHA = 25 DEGREES  
OH40 ALPHA = 30 DEGREES  
OH40 ALPHA = 35 DEGREES  
OH40 ALPHA = 40 DEGREES  
OH40 ALPHA = 45 DEGREES

V00T0521A/H-REF 065-1300 SEC

U-12 COLL. I/I-GRU



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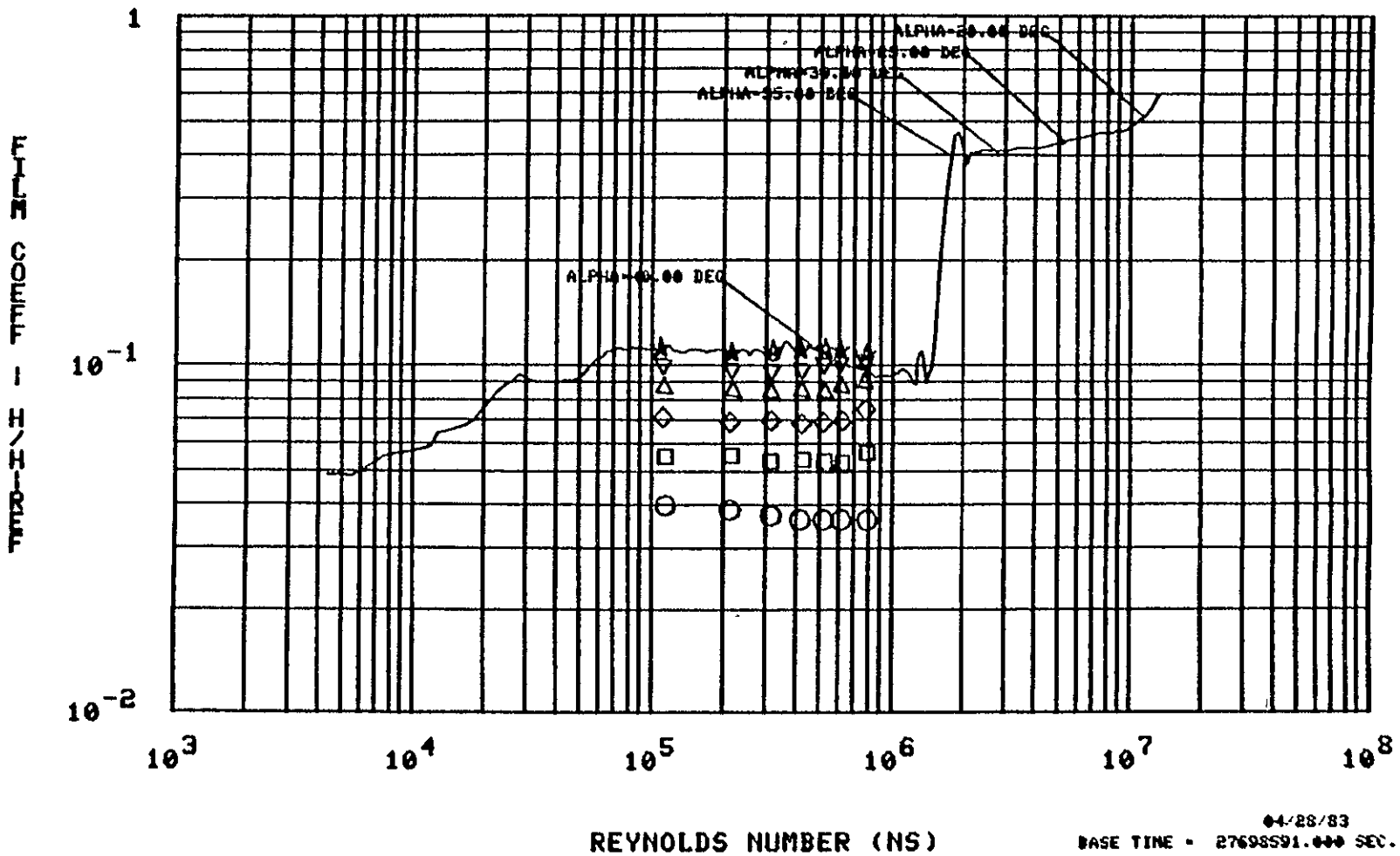
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05/02/83  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

○ OH49 ALPHA = 20 DEGREES  
 □ OH49 ALPHA = 25 DEGREES  
 ◇ OH49 ALPHA = 30 DEGREES  
 △ OH49 ALPHA = 35 DEGREES  
 ▼ OH49 ALPHA = 40 DEGREES  
 ★ OH49 ALPHA = 45 DEGREES

U09T9521A/H-REF 150-1350 SEC



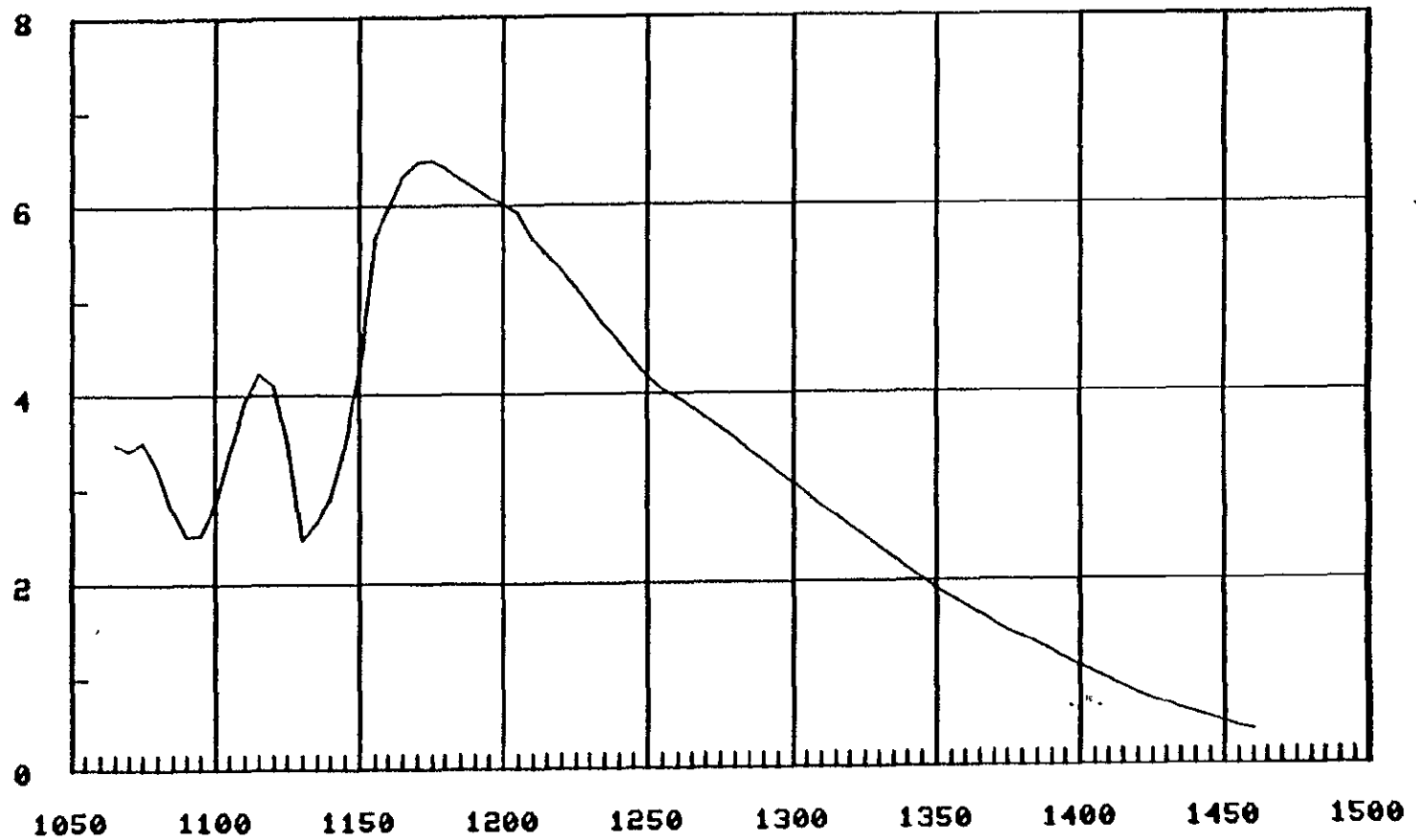
B-220

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# STS-1 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

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INCREASING ROOM - BUILDING - GAGE



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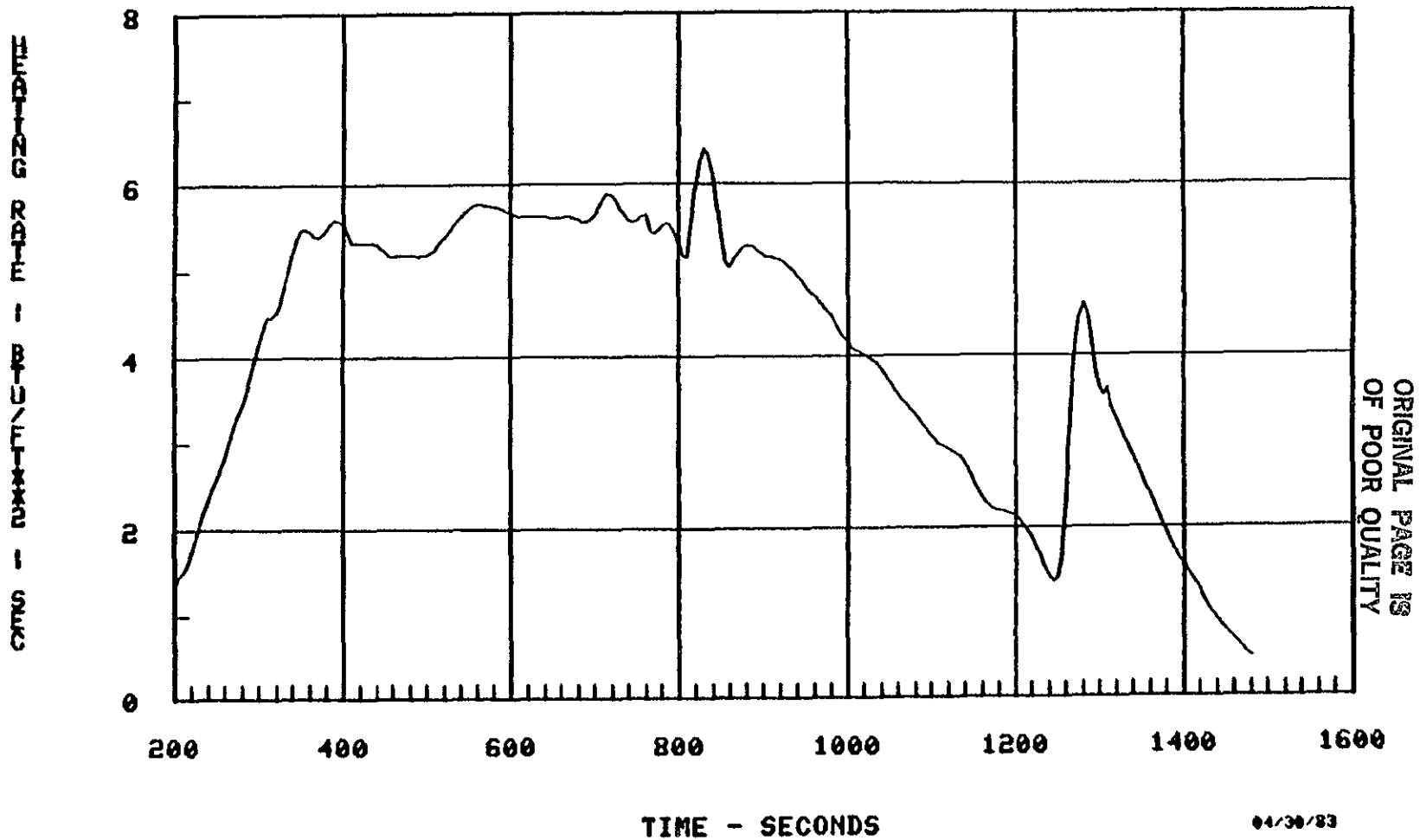
B-221

TIME - SECONDS

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

U09T9521A



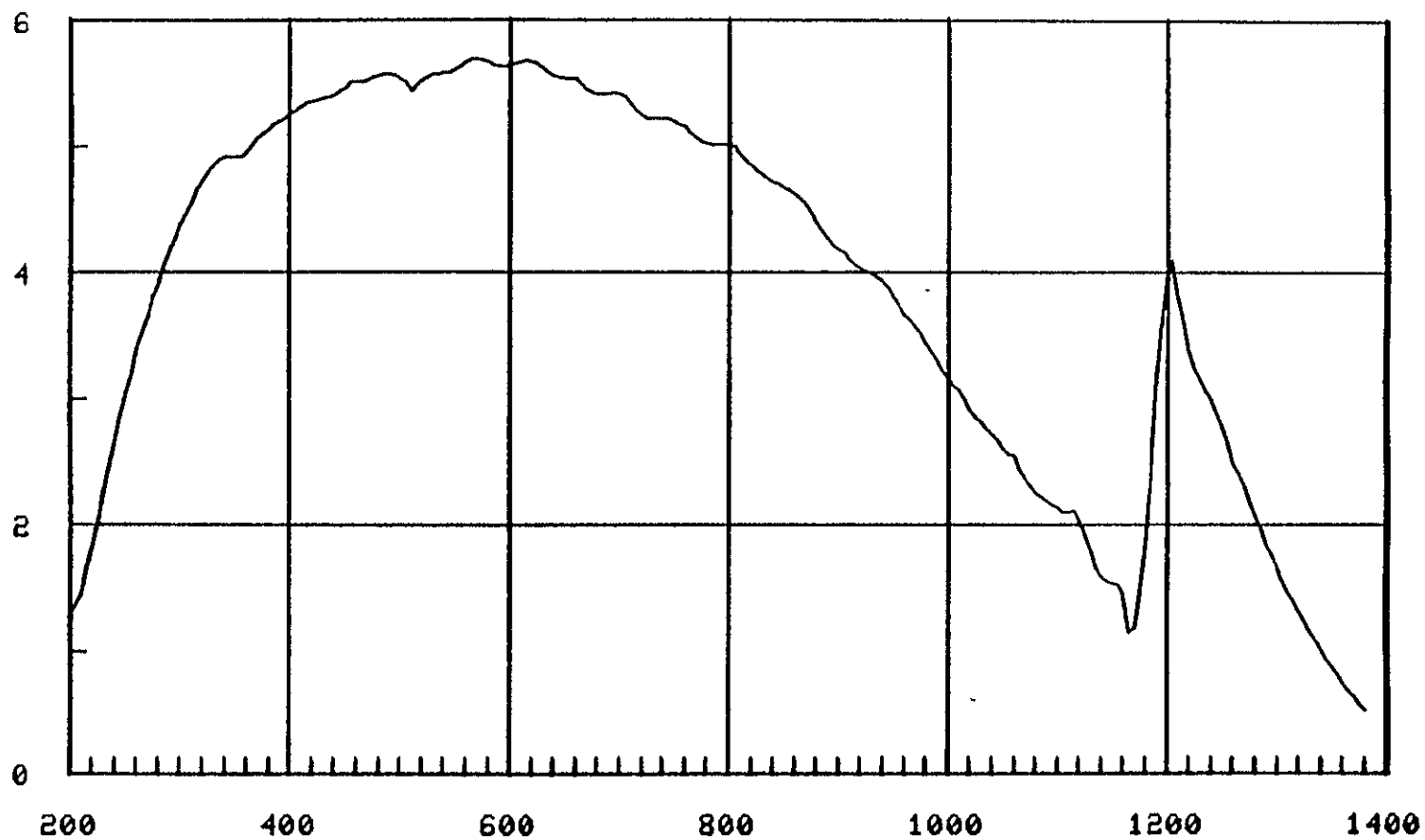
B-222

04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISON

U09T9521A

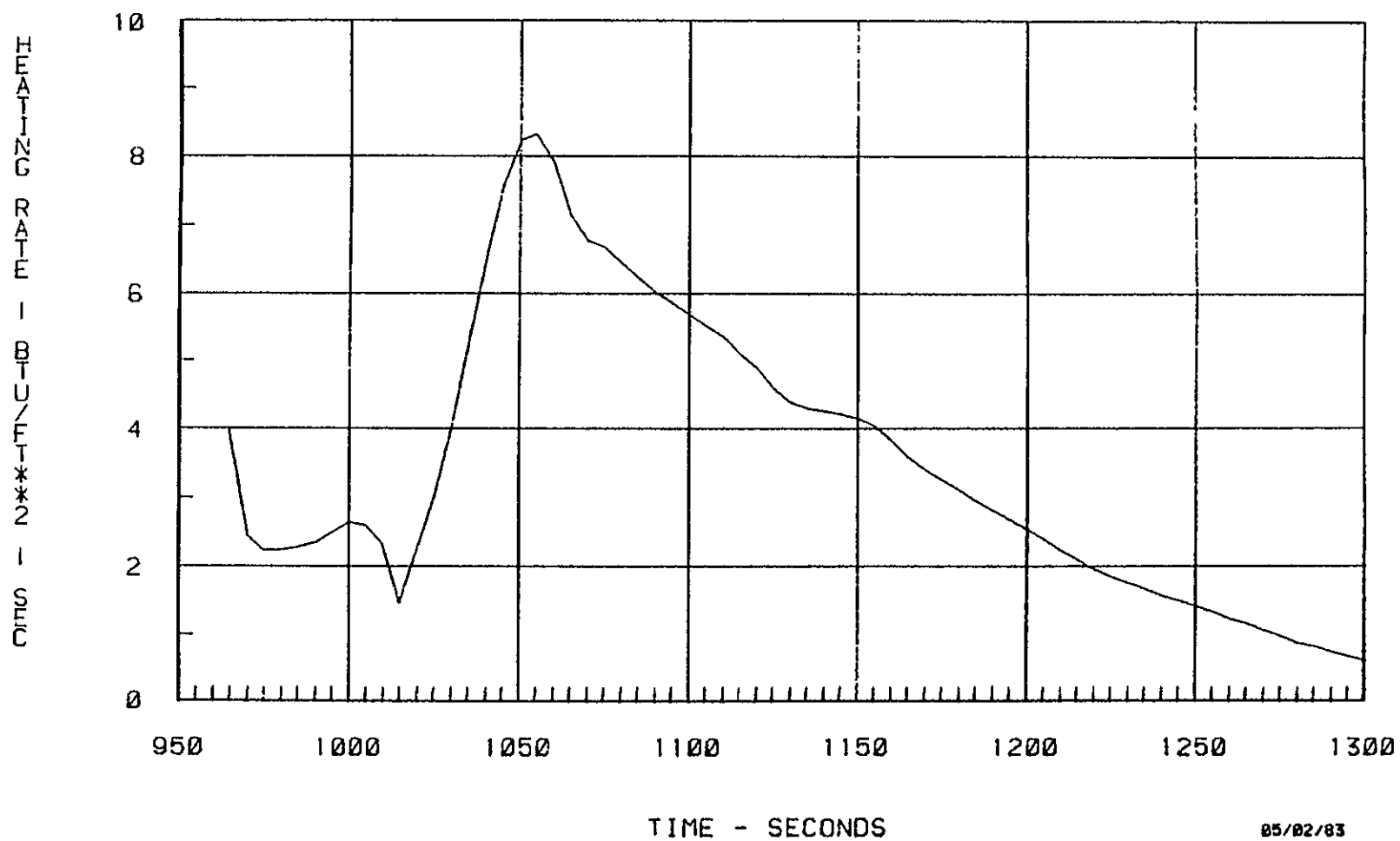
INDICATED RATE - ALTITUDE - GYRO



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STS-4 (107 FT LENGTH CL  $X/L=0.50$ ) FLIGHT PARAMETER COMPARISO

———— V00T0521A



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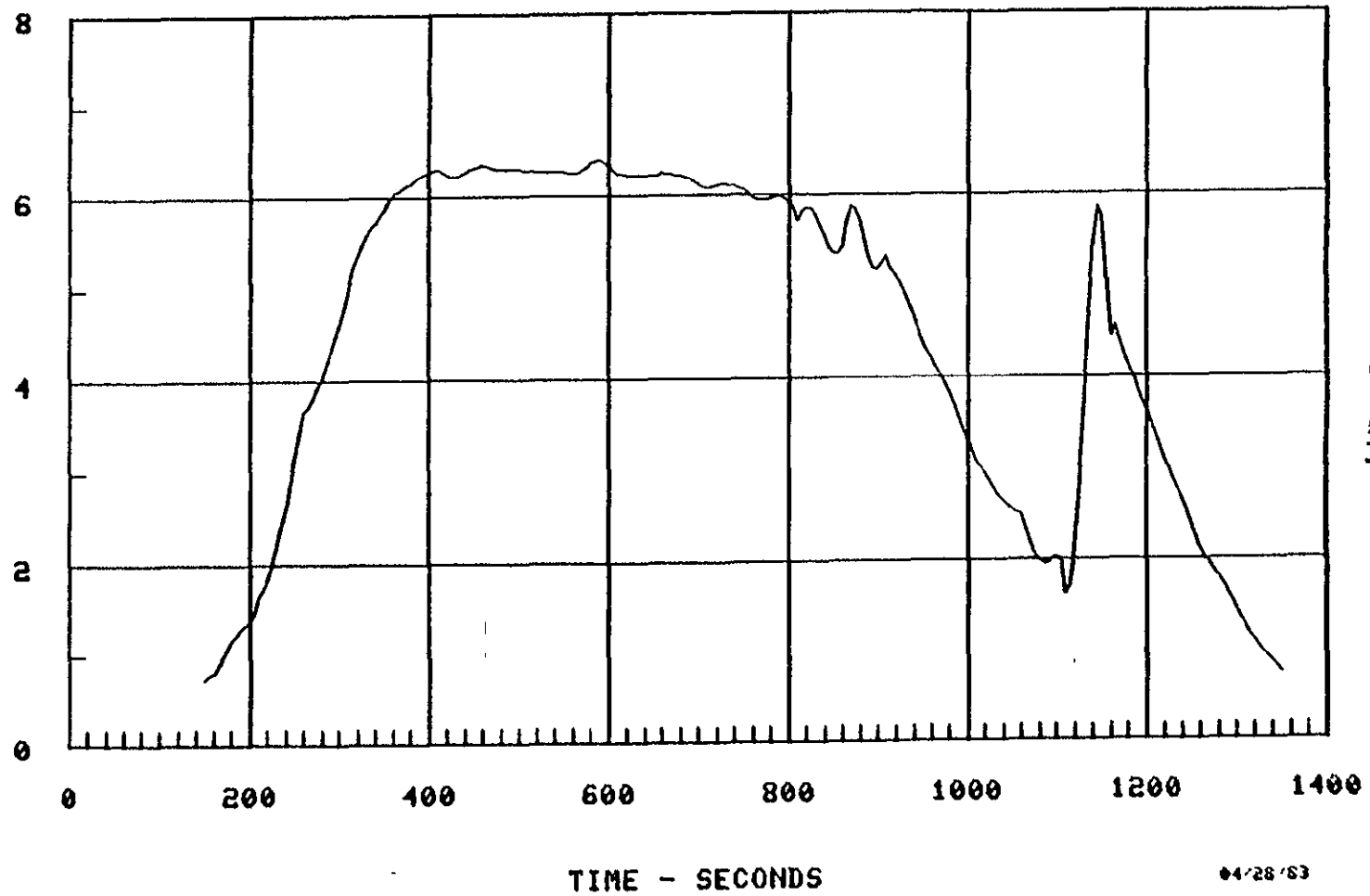


# STS-5 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

U09T9521A

RECEIVED - BUREAU OF AERONAUTICS - SAC

B-225

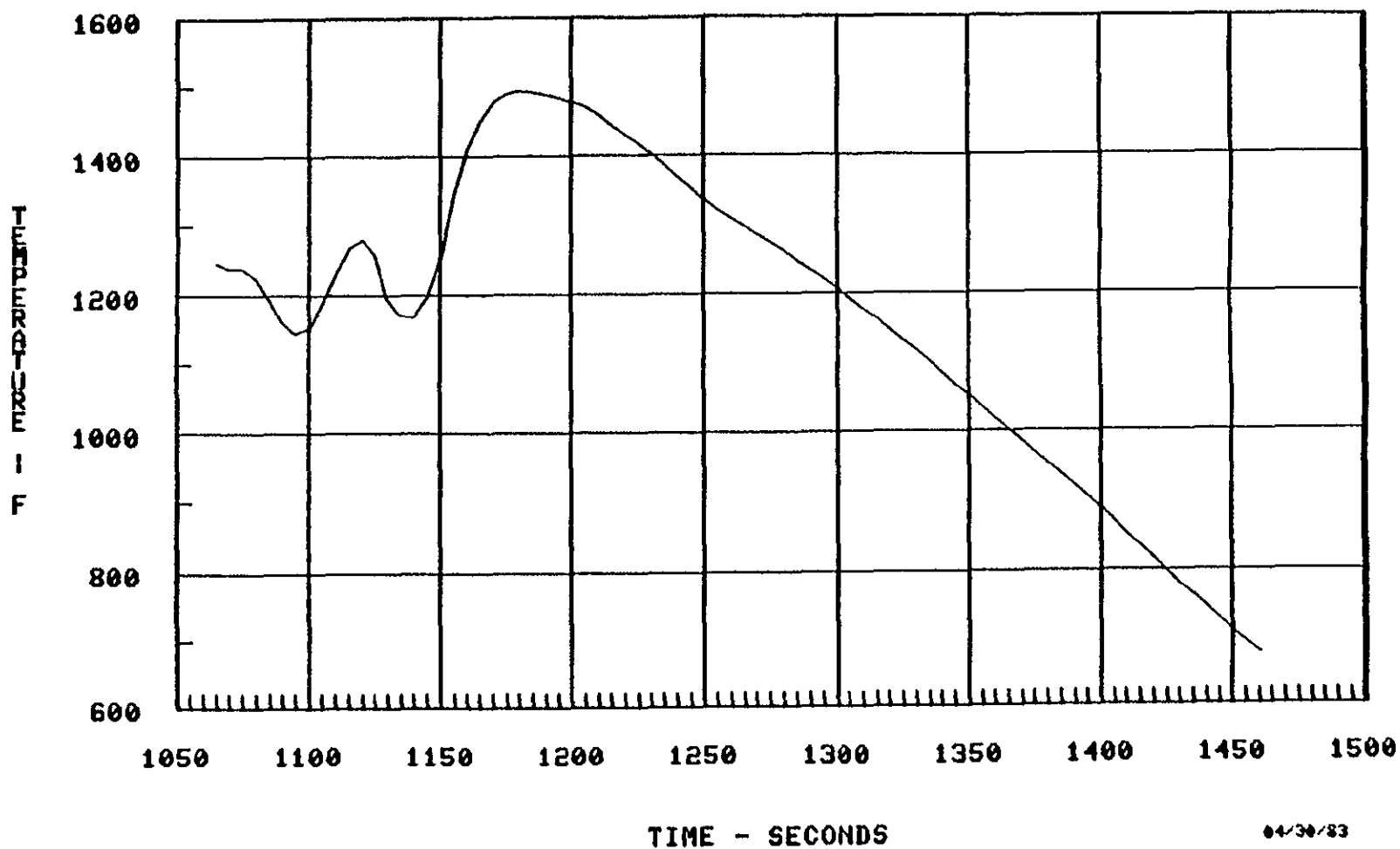


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04/28/83

# STS-1 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

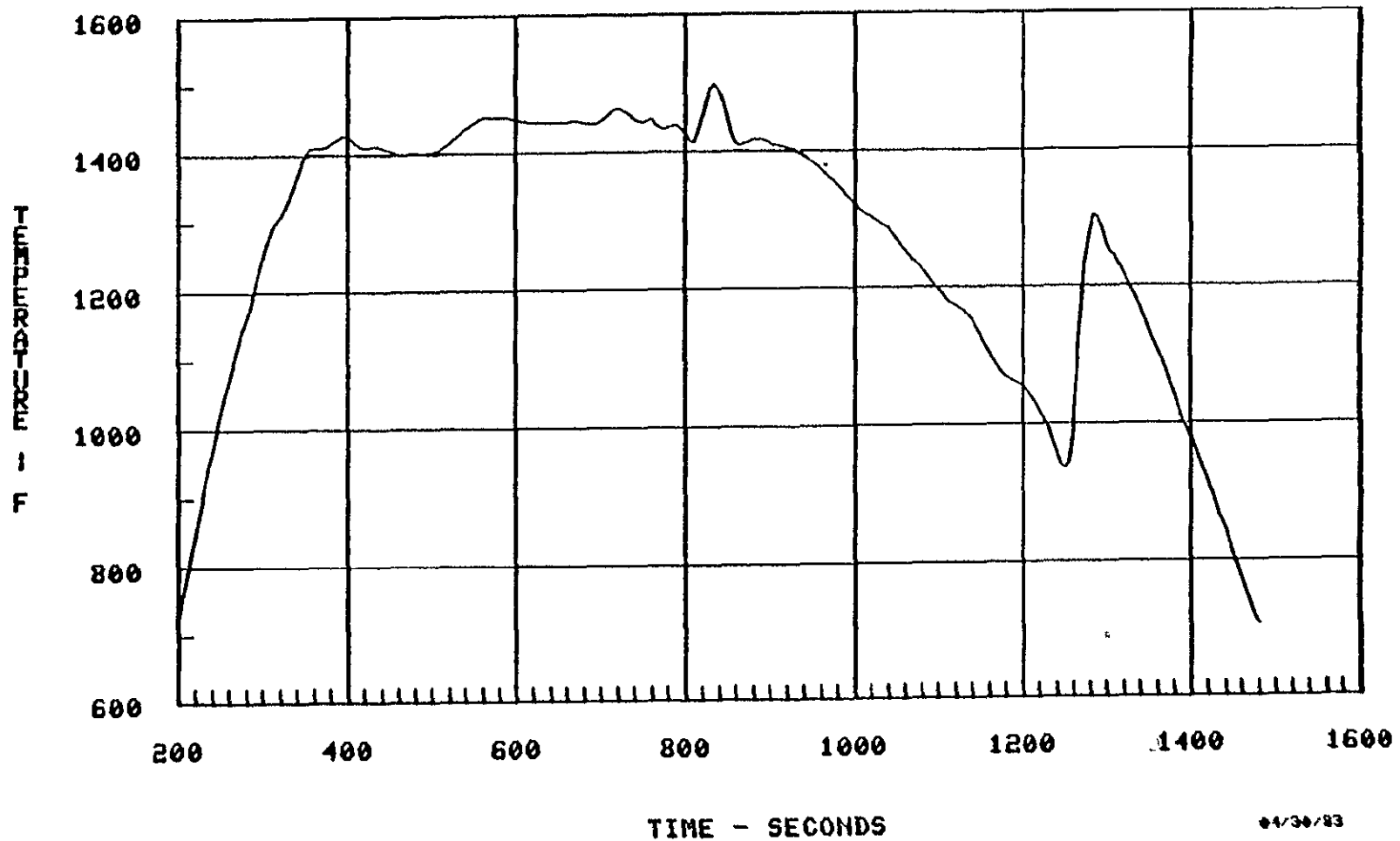
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# STS-2 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

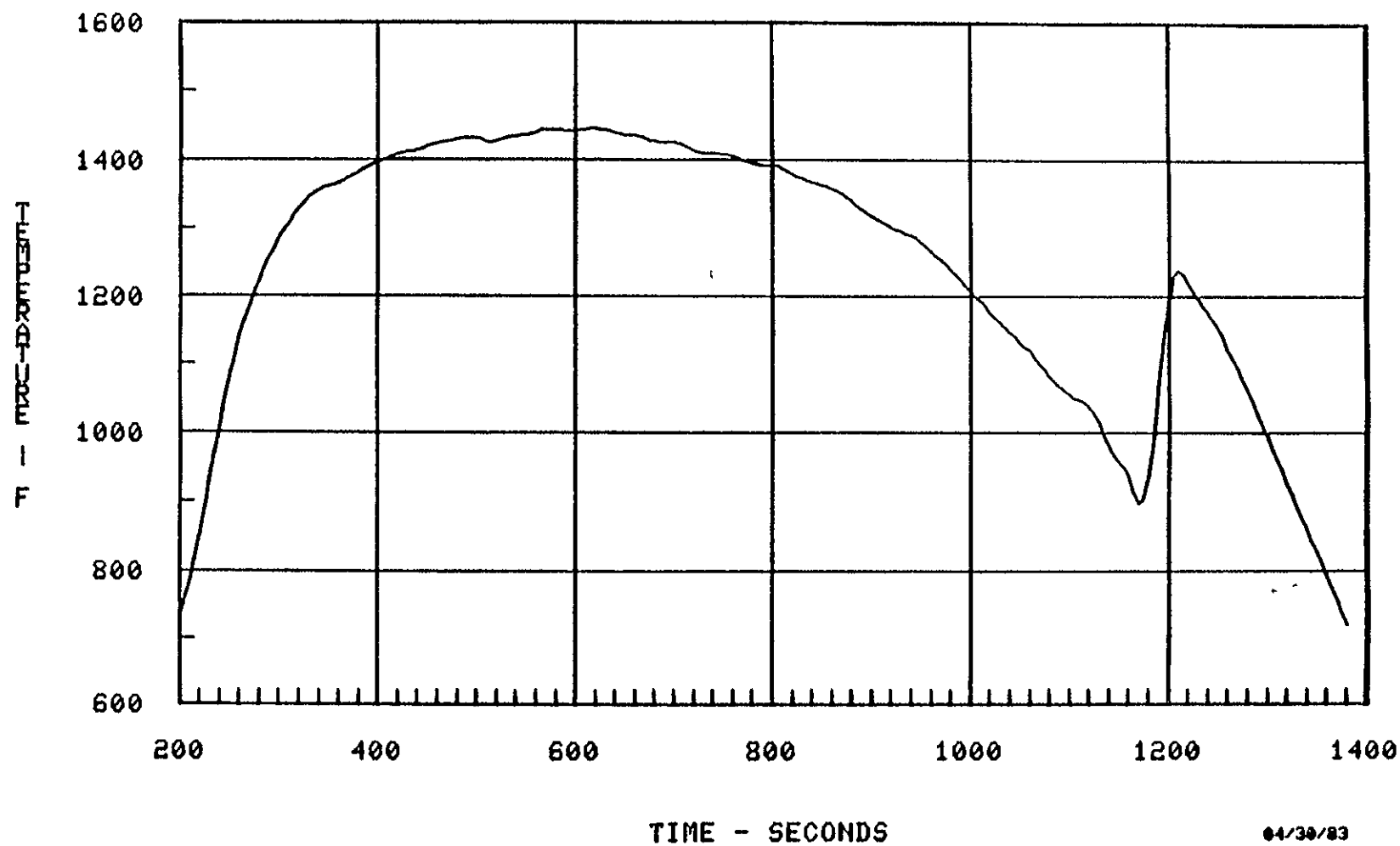
U09T9521A



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# STS-3 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

U09T9521A



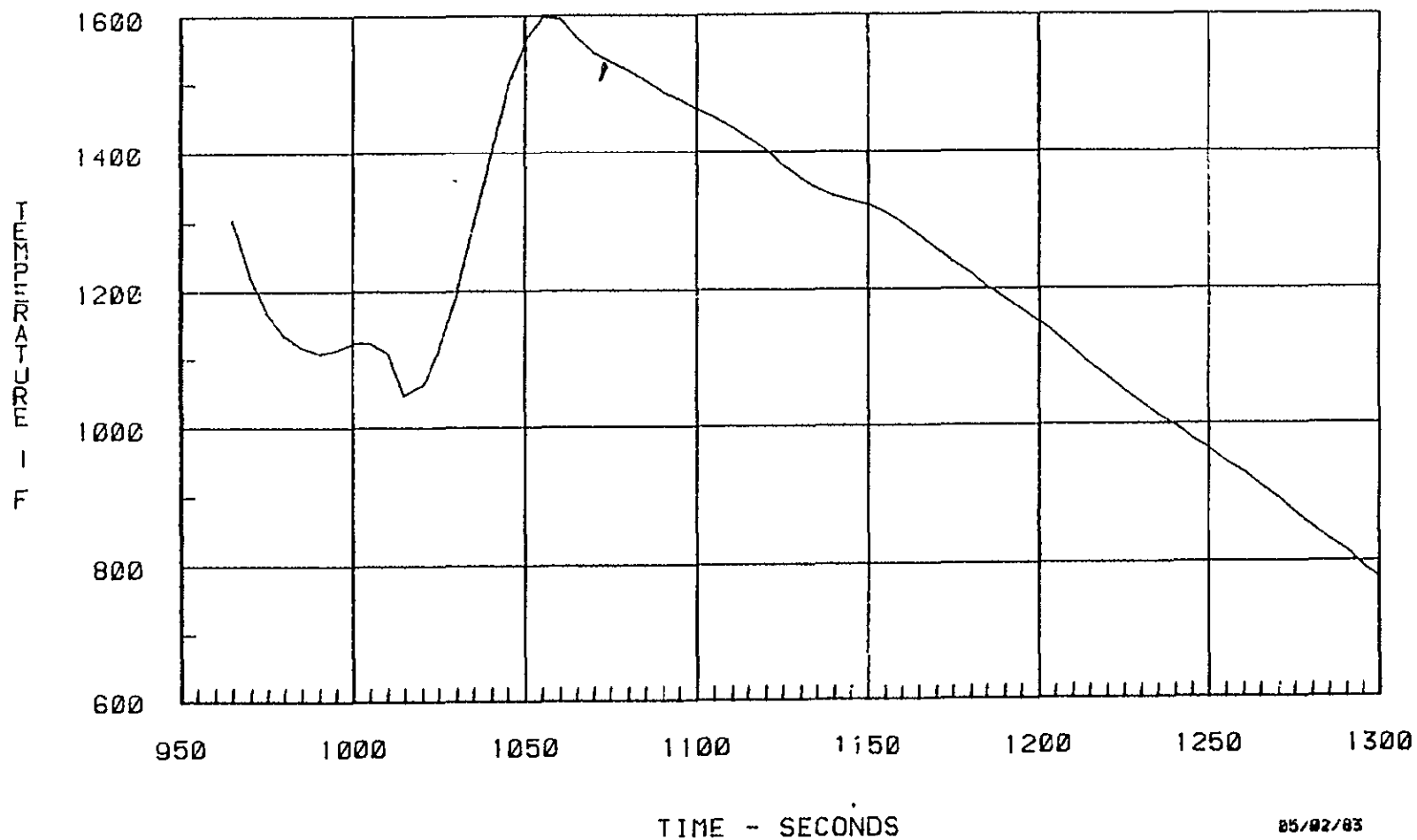
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04/30/83

5-223

# STS-4 (107 FT LENGTH CL $X/L=0.50$ ) FLIGHT PARAMETER COMPARISO

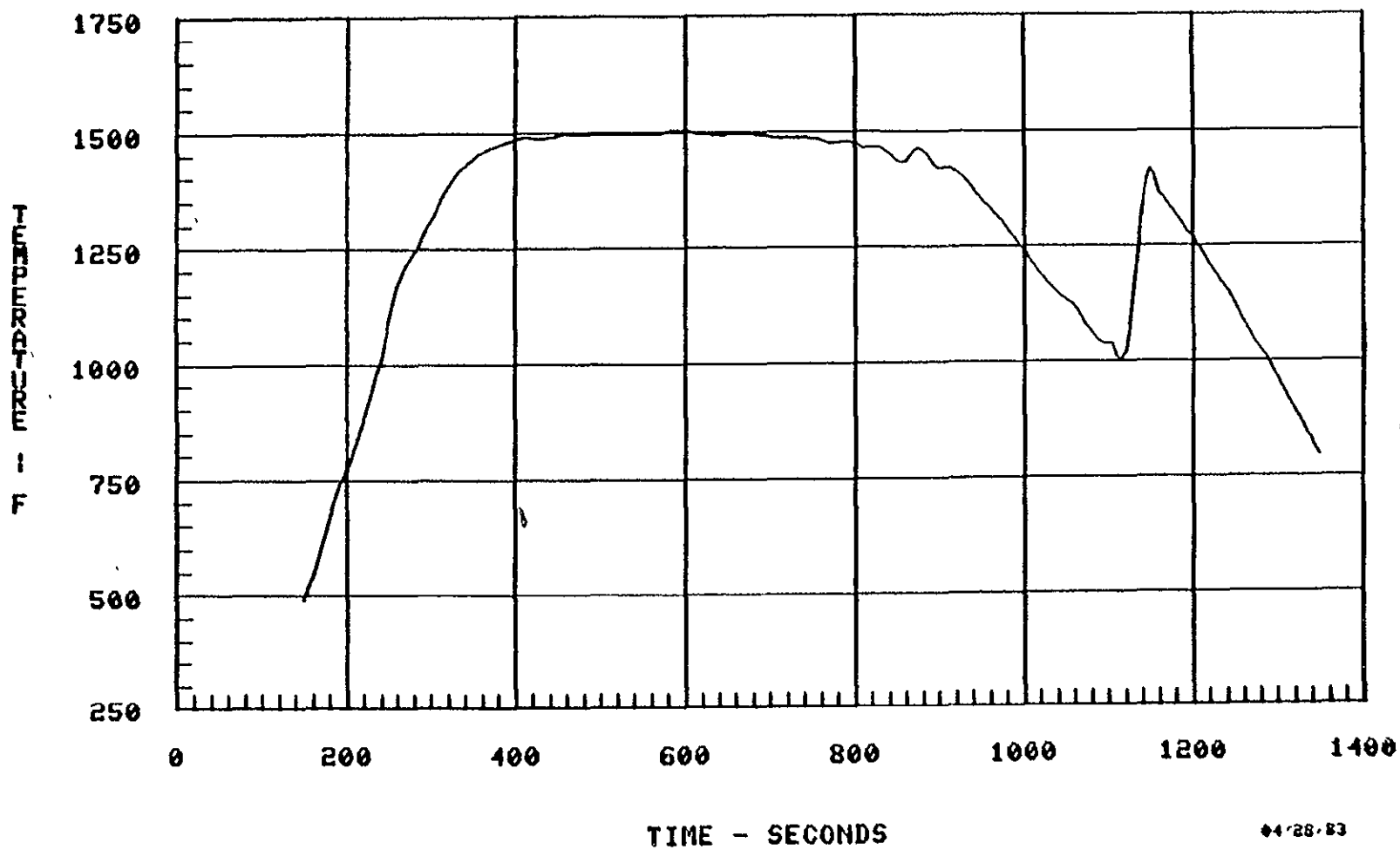
V09T0521A



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# STS-5 (107 FT LENGTH CL X/L=0.50) FLIGHT PARAMETER COMPARISO

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B-230

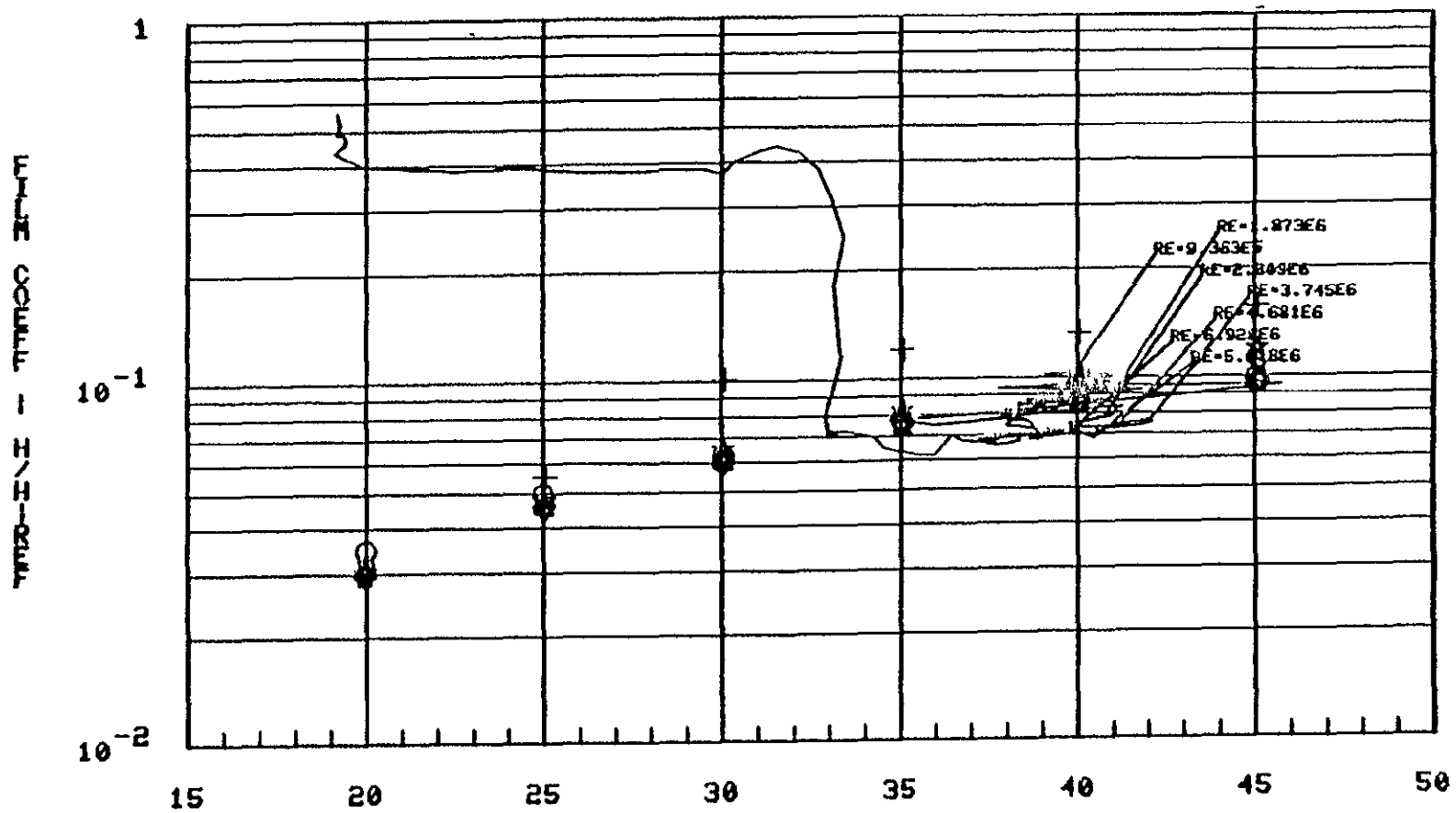
4/28/83

# STS-2 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9478A/H-REF 200-1480 SEC



B-231

ANGLE-OF-ATTACK - DEG

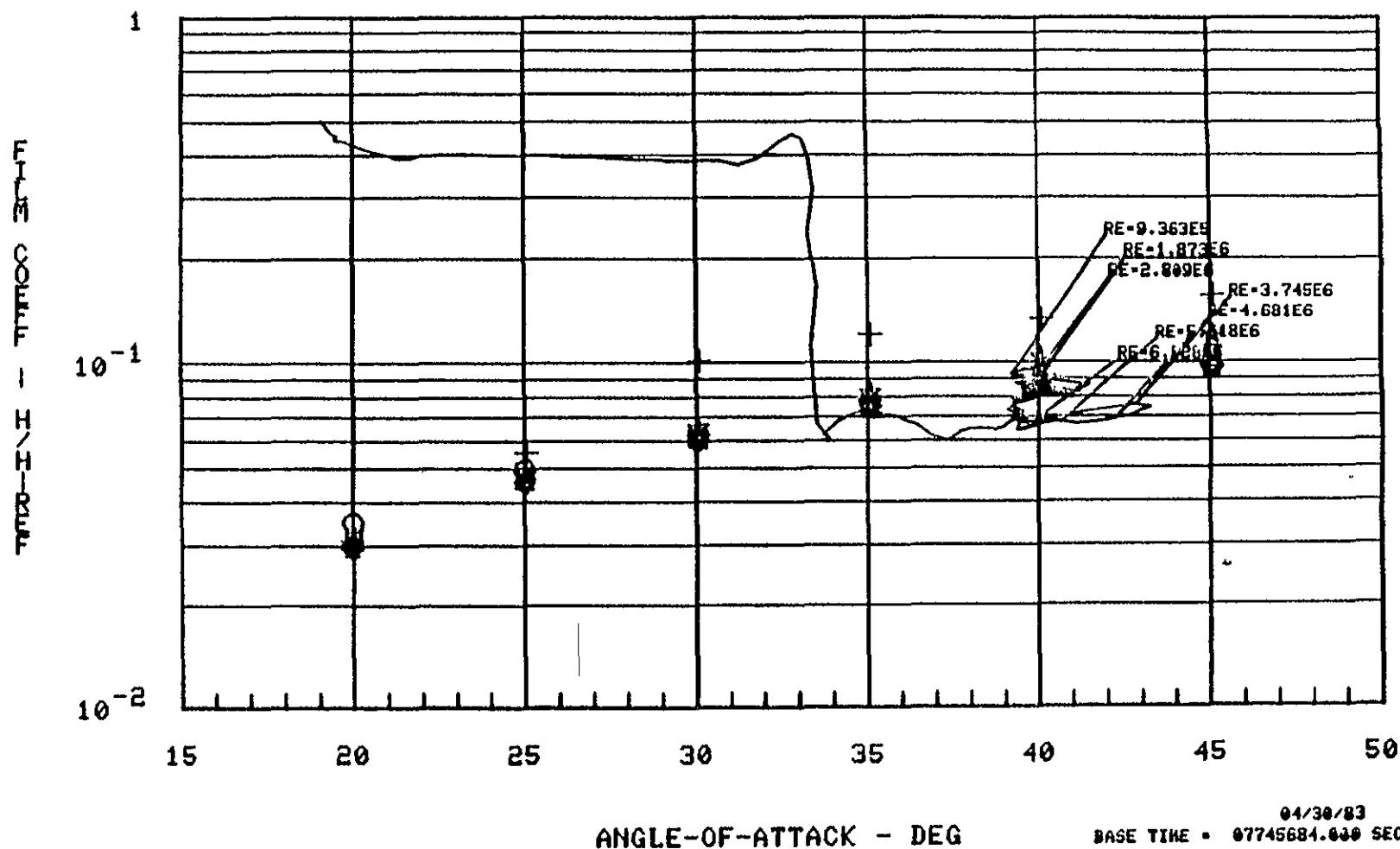
04/30/83  
BASE TIME = 27550236.640 SEC.

# STS-3 (107 FT LENGTH CL $X/L=0.60$ ) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9478A/H-REF 200-1380 SEC



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OF POOR QUALITY



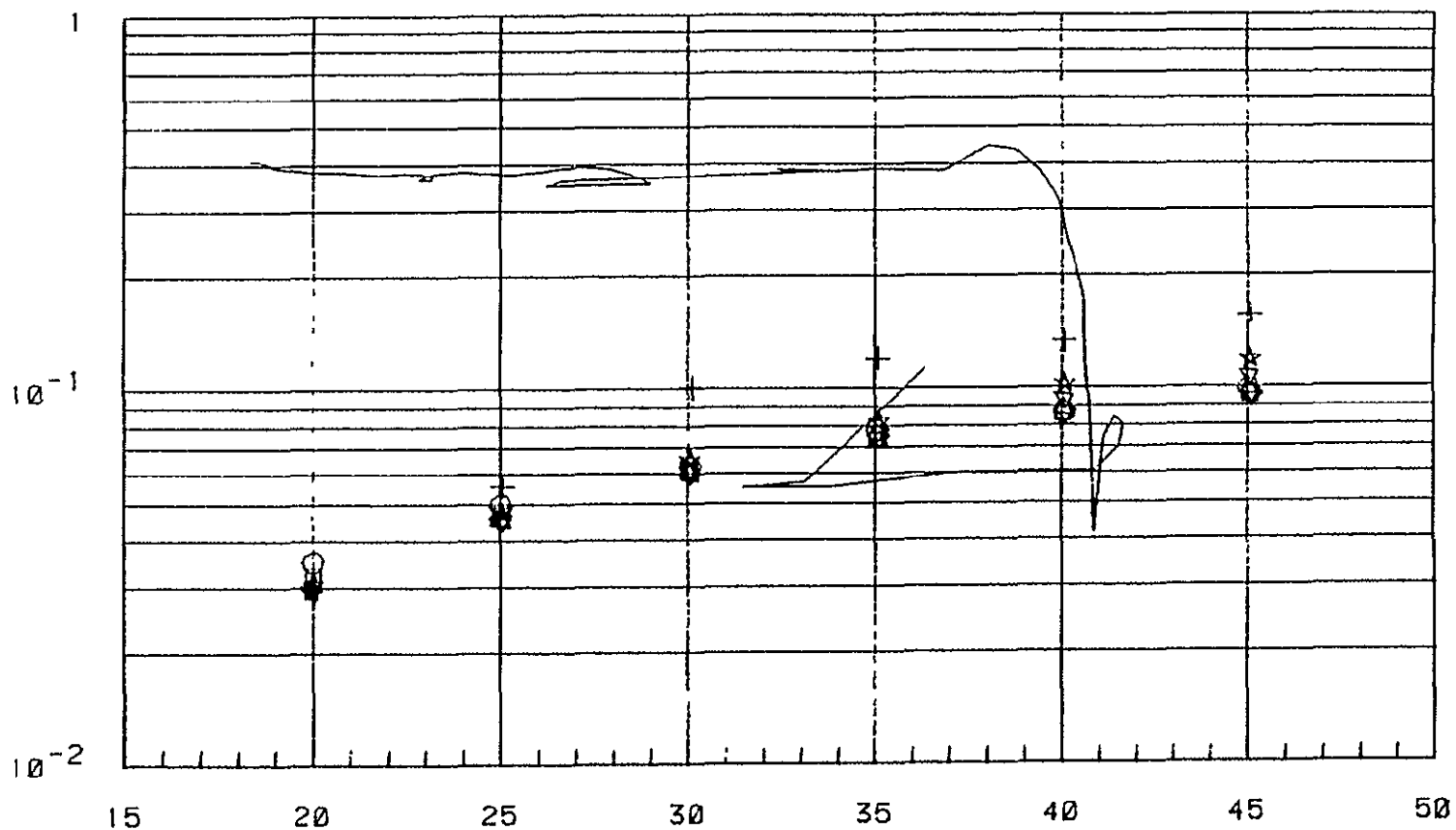
# STS-4 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★  
+

0H40 0 0175 SCALE RE = 0 5 E06  
 0H40 0 0175 SCALE RE = 1 0 E06  
 0H40 0 0175 SCALE RE = 1 5 E06  
 0H40 0 0175 SCALE RE = 2 0 E06  
 0H40 0 0175 SCALE RE = 2 5 E06  
 0H40 0 0175 SCALE RE = 3 0 E06  
 0H40 0 0175 SCALE RE = 3 7 E06

V07T0478A/H-REF 065-1300 SEC

FLIGHT QUALITY - INITIAL



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OF POOR QUALITY

B-233

ANGLE-OF-ATTACK - DEG

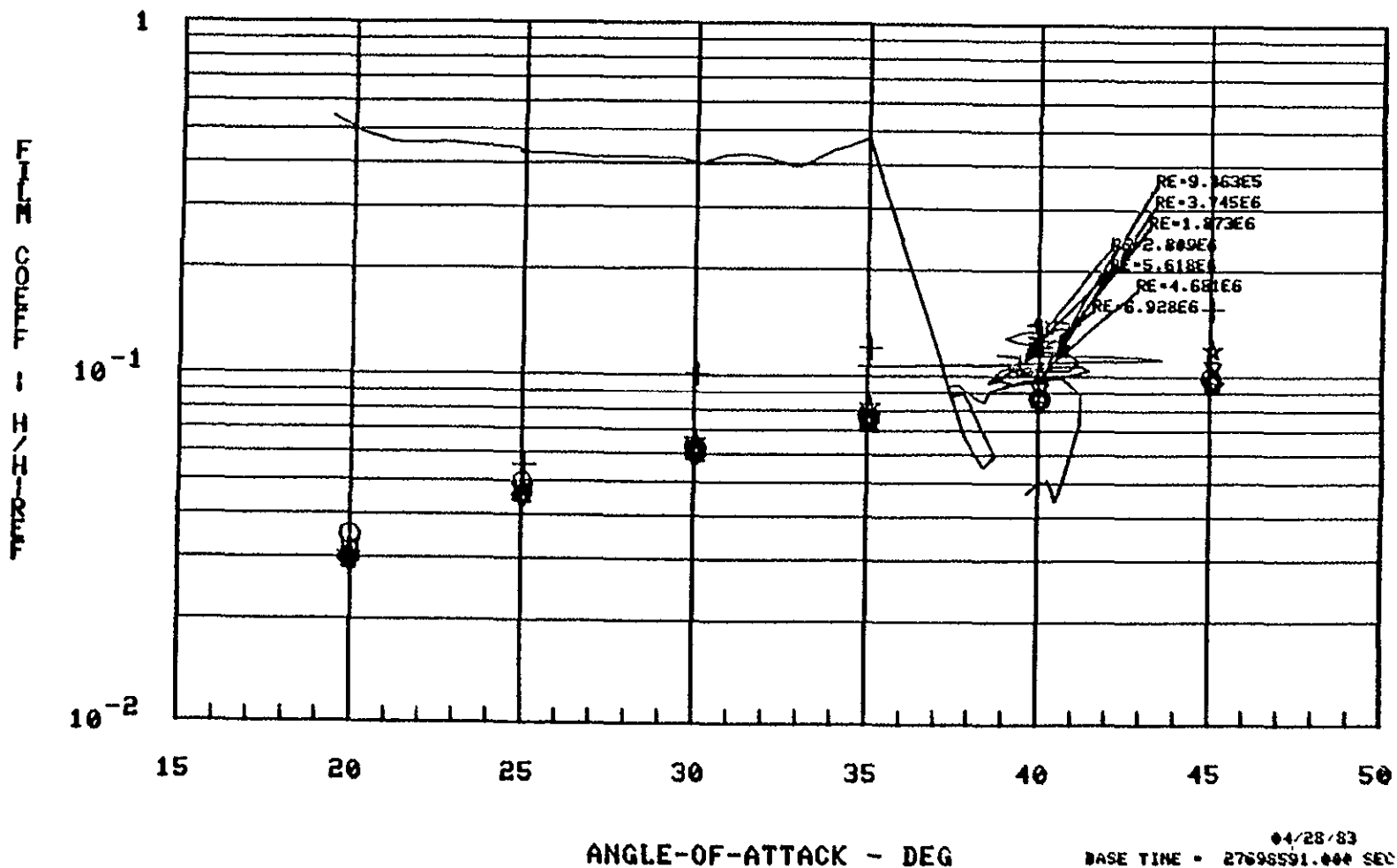
05/02/83  
 BASE TIME = 16040423 000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9478A/H-REF 150-1350 SEC

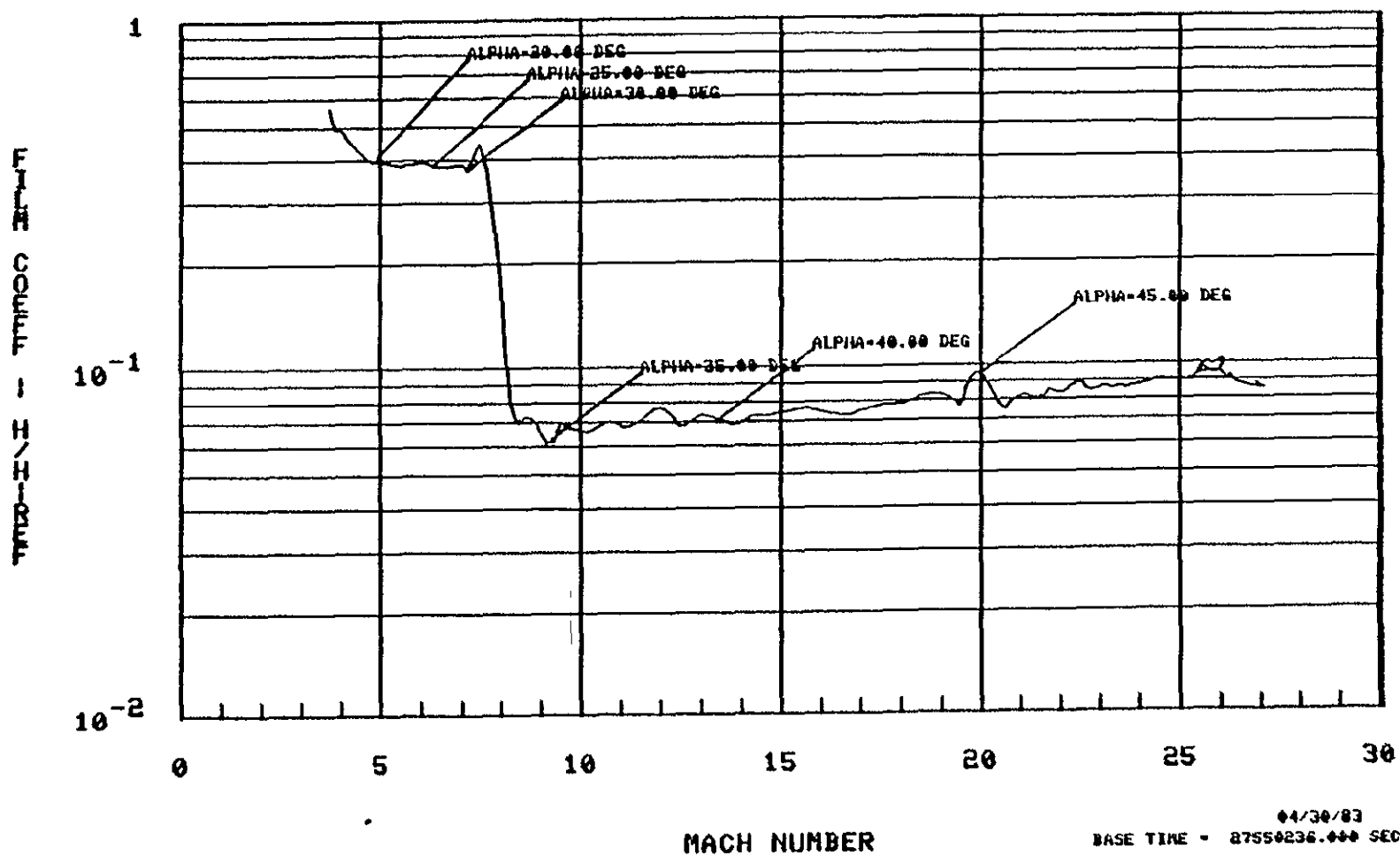


B-234

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# ST5-2 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISON

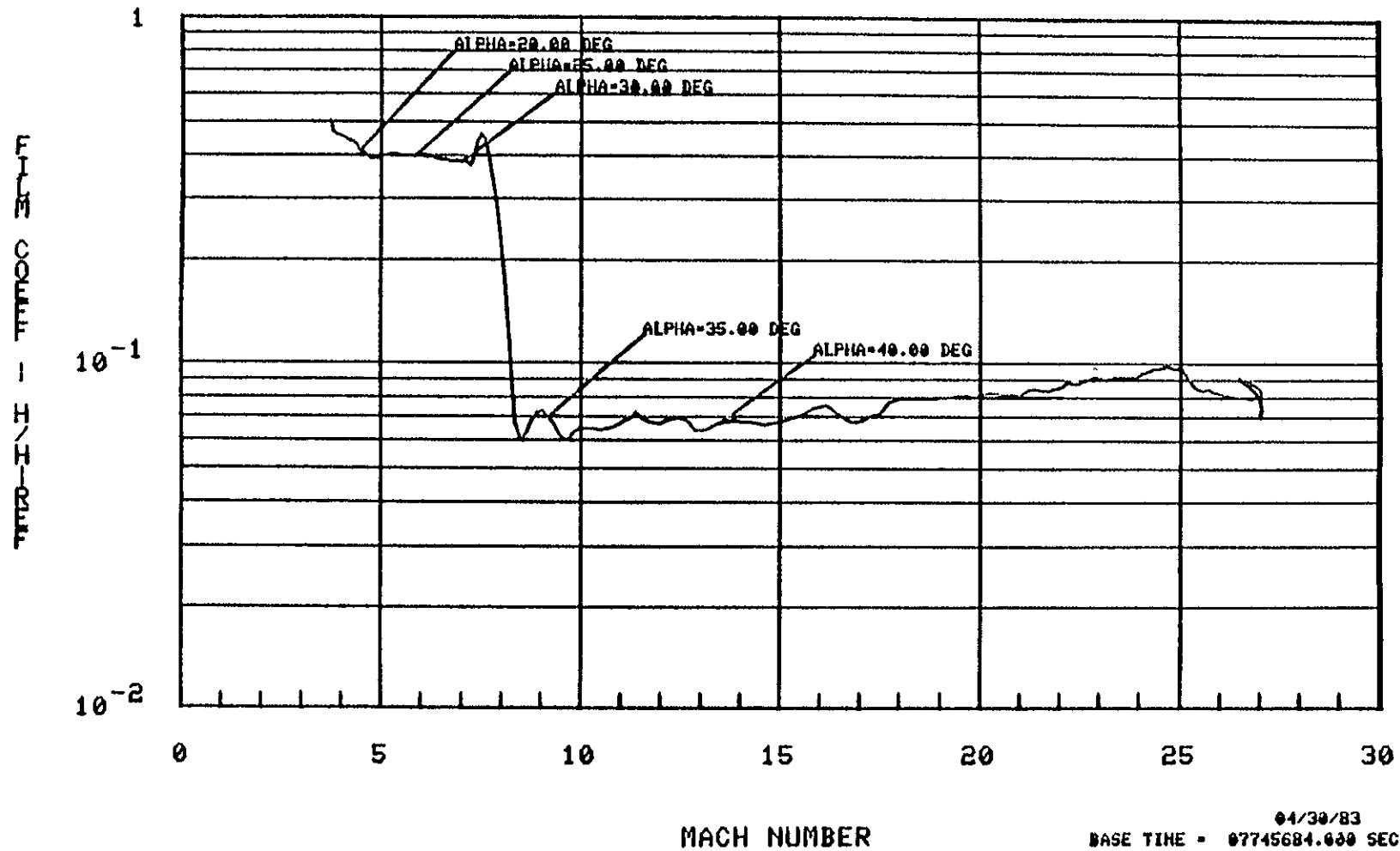
U07T9478A/H-REF 200-1480 SEC



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# STS-3 (107 FT LENGTH CL $X/L=0.60$ ) FLIGHT PARAMETER COMPARISON

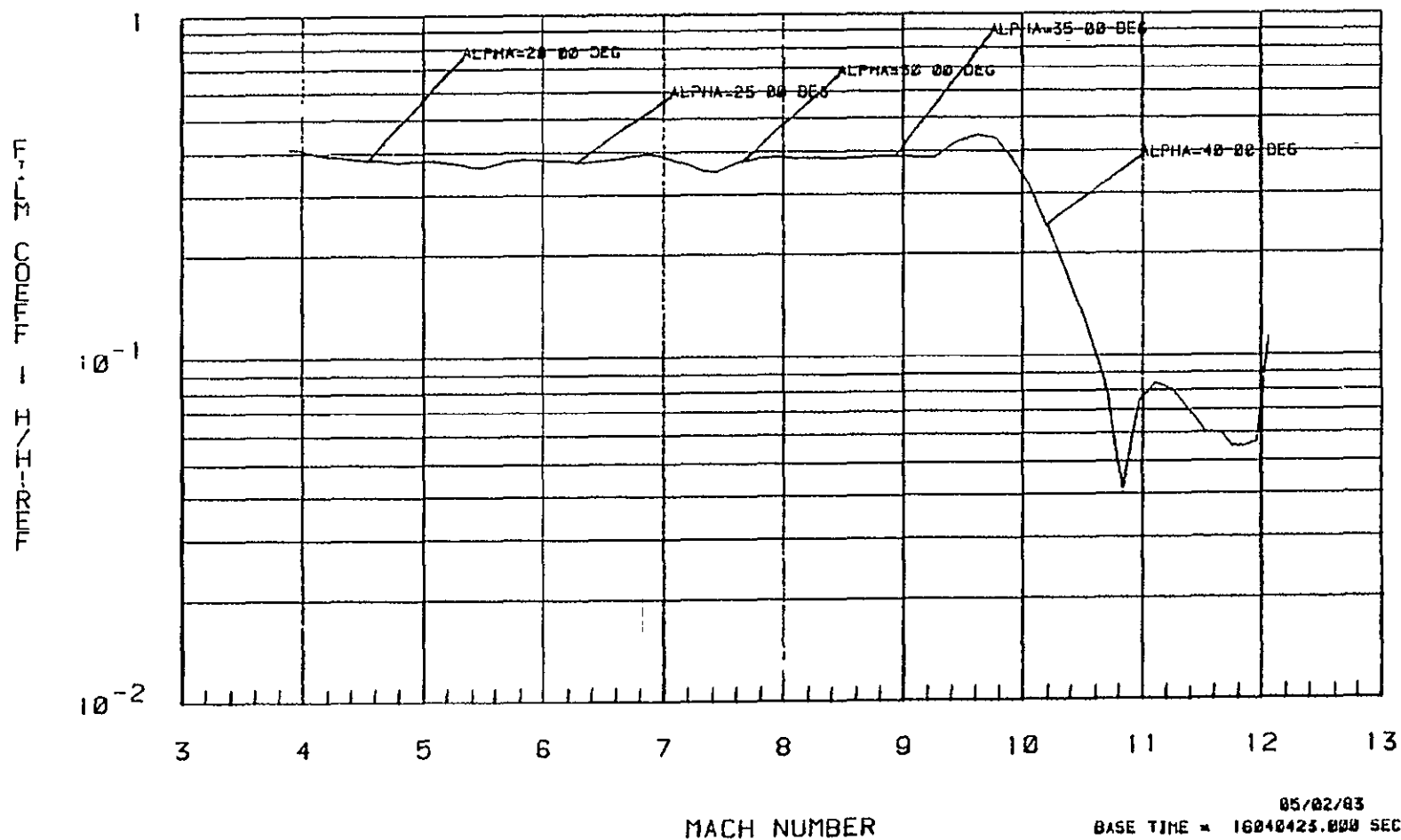
U07T9478A/H-REF 200-1380 SEC



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# STS-4 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISON

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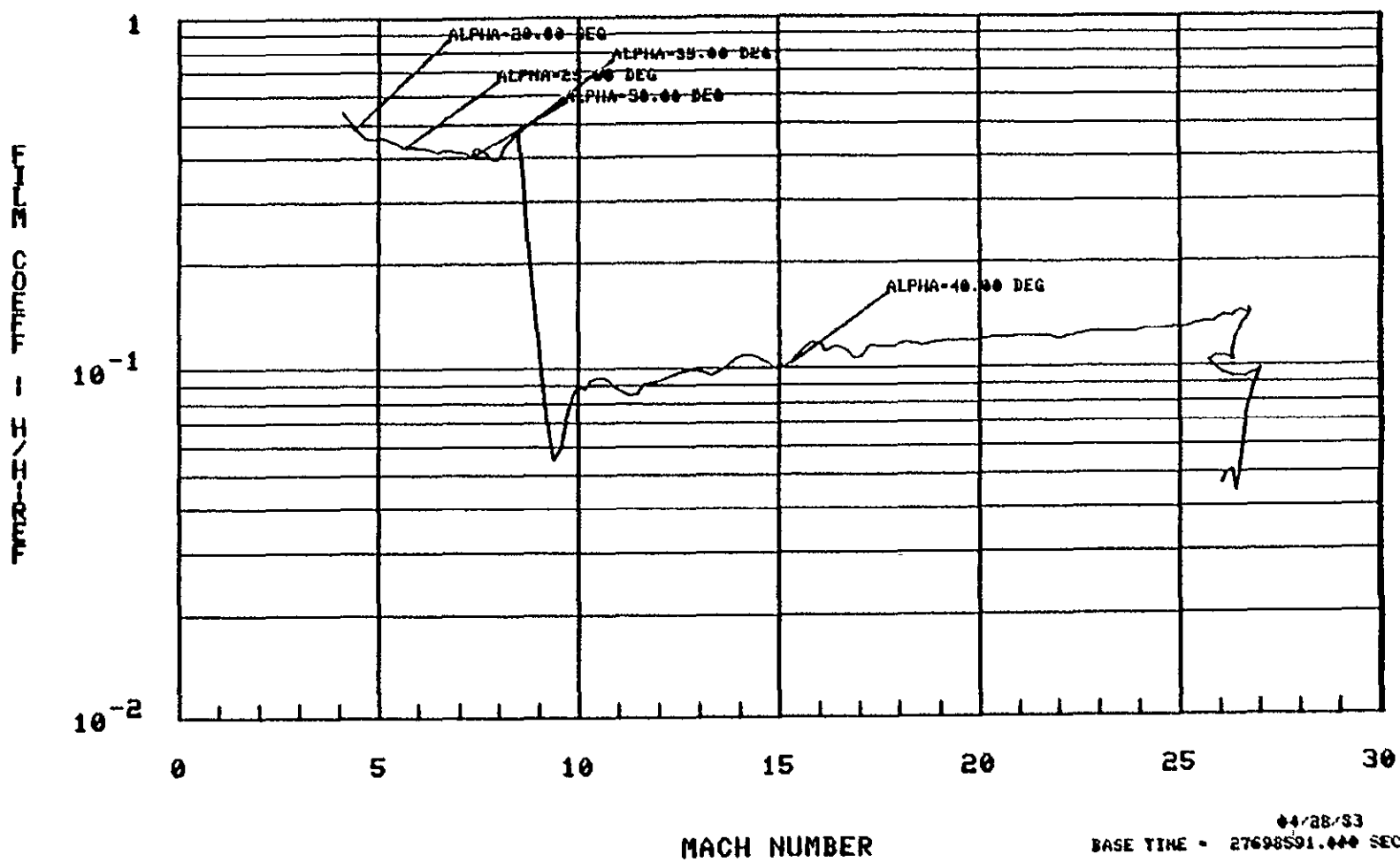
B-237

05/02/83

BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

U07T9478A/H-REF 150-1350 SEC



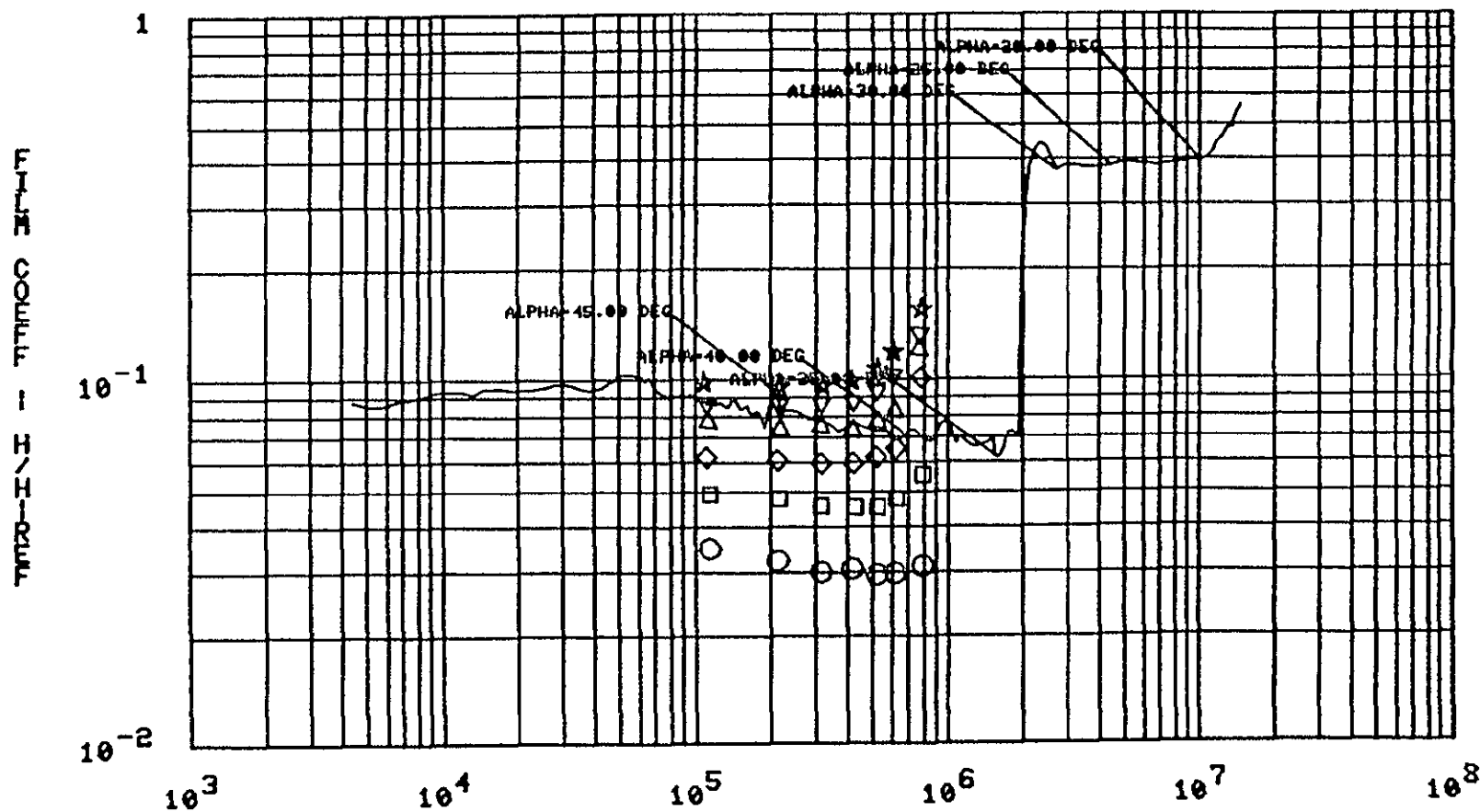
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# STS-2 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9478A/H-REF 200-1480 SEC



B-239

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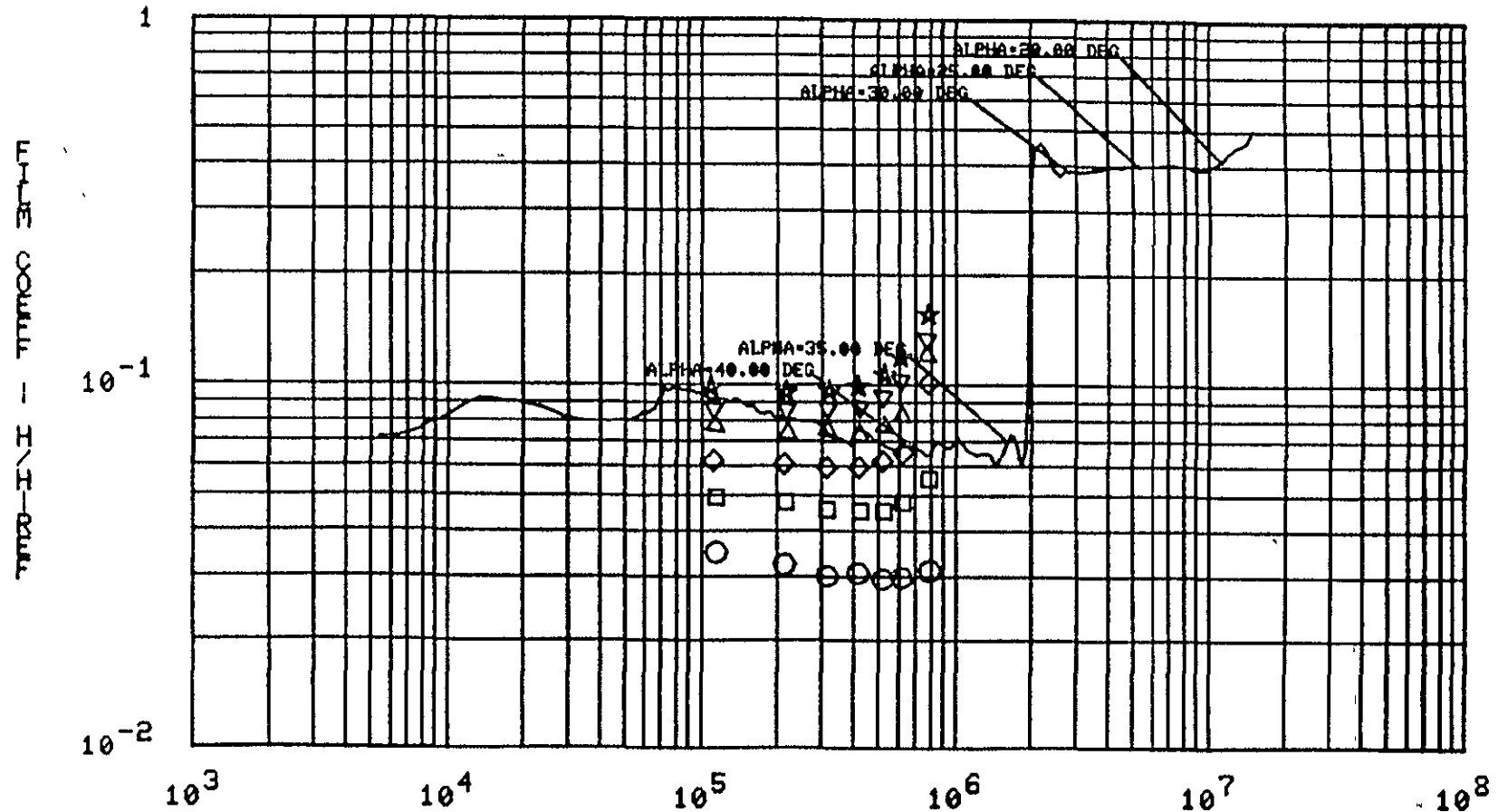
REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME = 27550236.000 SEC.

# ST5-3 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISON

- OH49 ALPHA = 20 DEGREES
- OH49 ALPHA = 25 DEGREES
- ◇ OH49 ALPHA = 30 DEGREES
- △ OH49 ALPHA = 35 DEGREES
- ▽ OH49 ALPHA = 40 DEGREES
- ★ OH49 ALPHA = 45 DEGREES

U07T9478A/H-REF 200-1380 SEC



LIFT COEFFICIENT - CL

B-240

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REYNOLDS NUMBER (NS)

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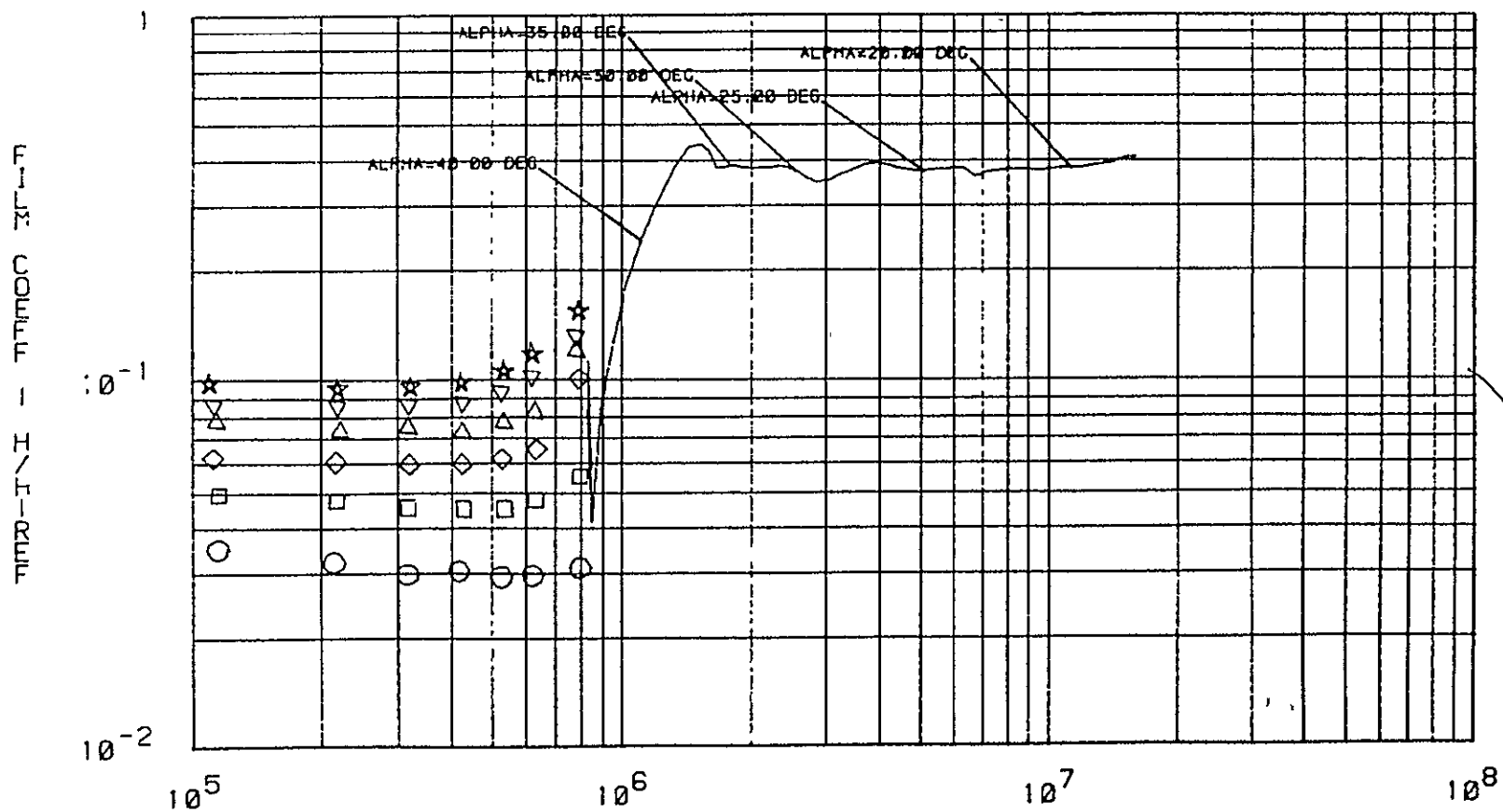


# STS-4 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

V07T0478A/H-REF 065-1300 SEC



REYNOLDS NUMBER (NS)

05/02/83  
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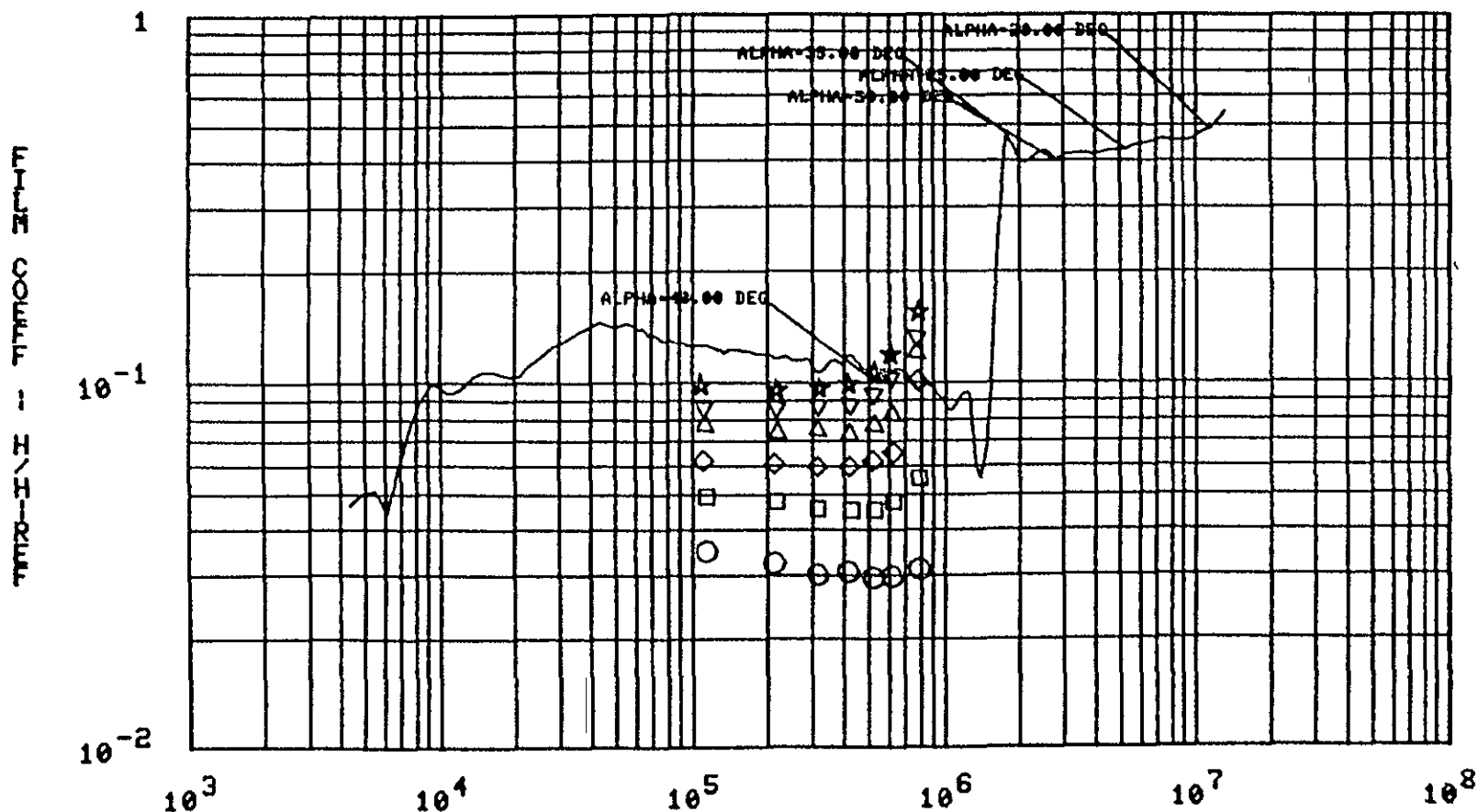
B-241

# STS-5 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9478A/H-REF 150-1350 SEC



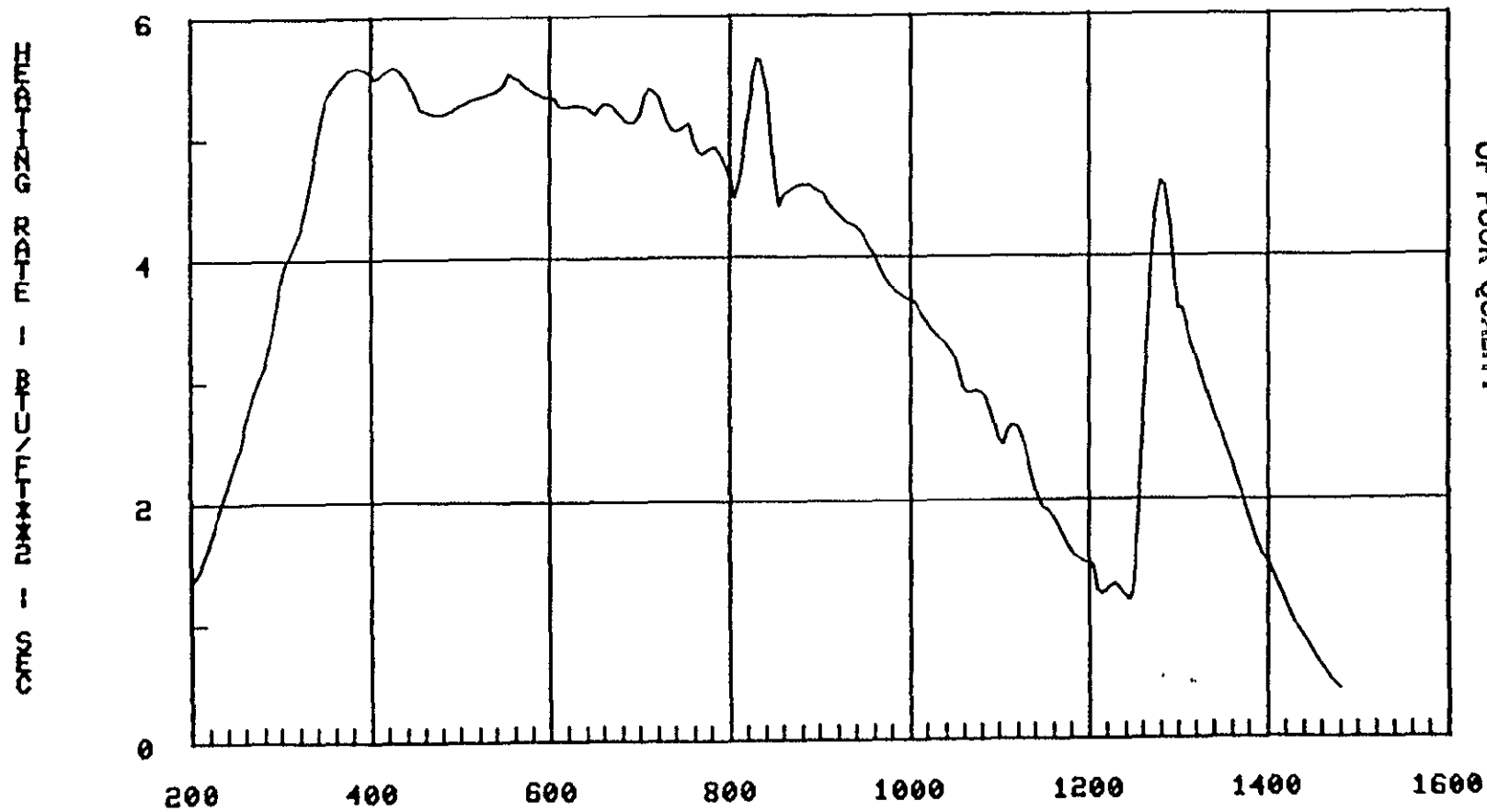
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REYNOLDS NUMBER (NS)

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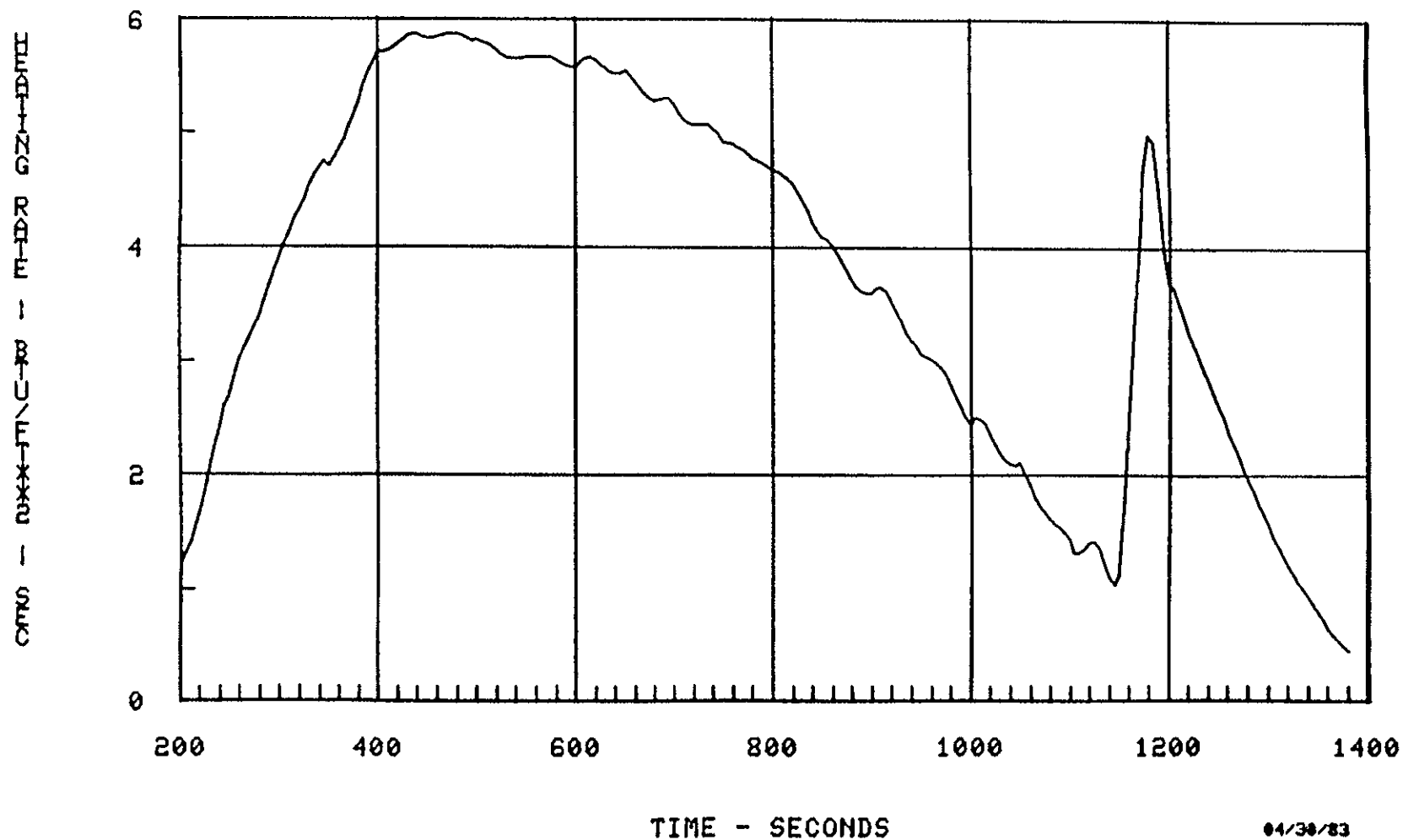
B-243

TIME - SECONDS

04/30/83

# STS-3 (107 FT LENGTH CL $X/L=0.60$ ) FLIGHT PARAMETER COMPARISO

U07T9478A

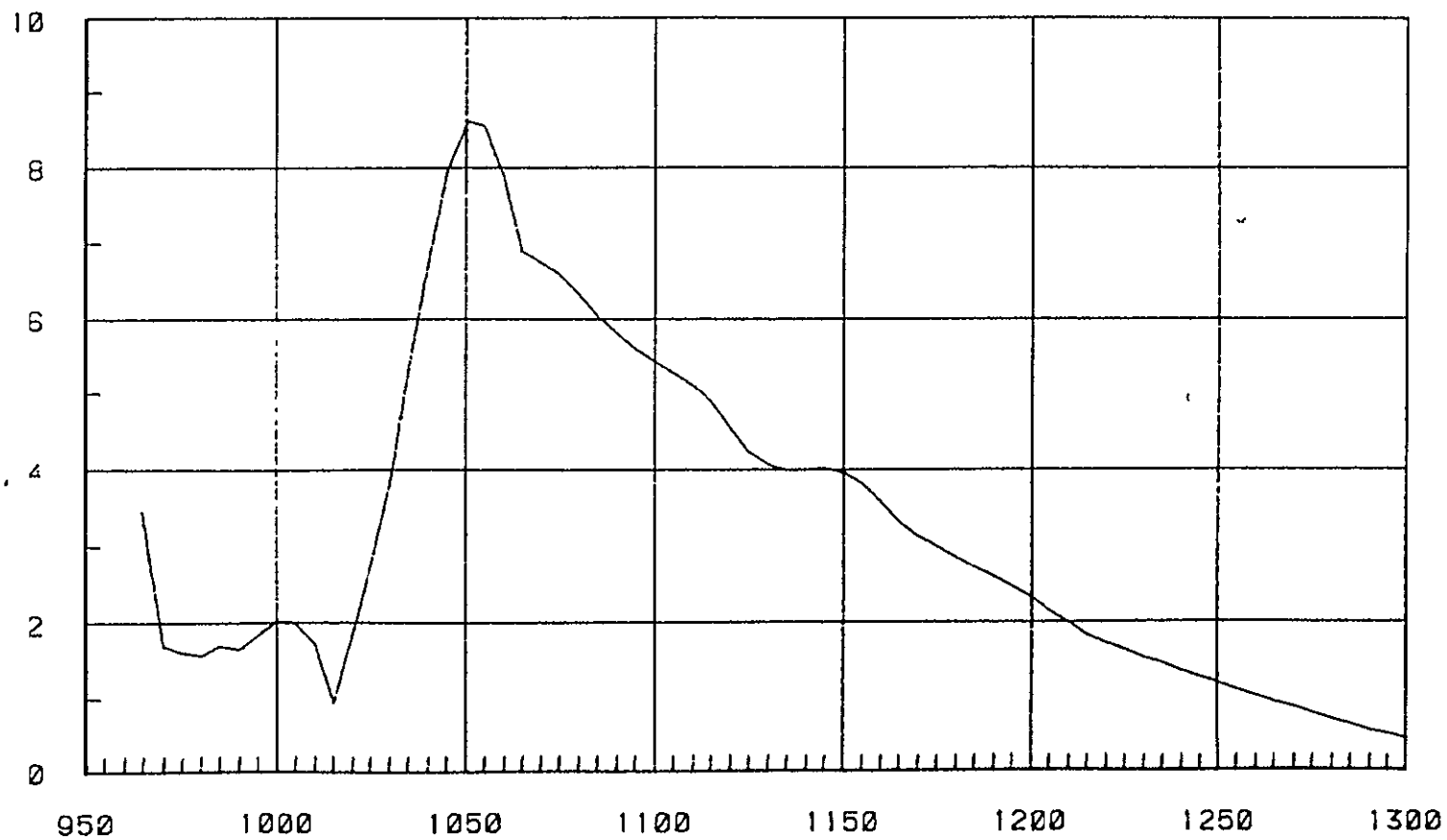


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STS-4 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

V87T0478A

HEATING RATE - BTU/FT\*\*2 - SEC



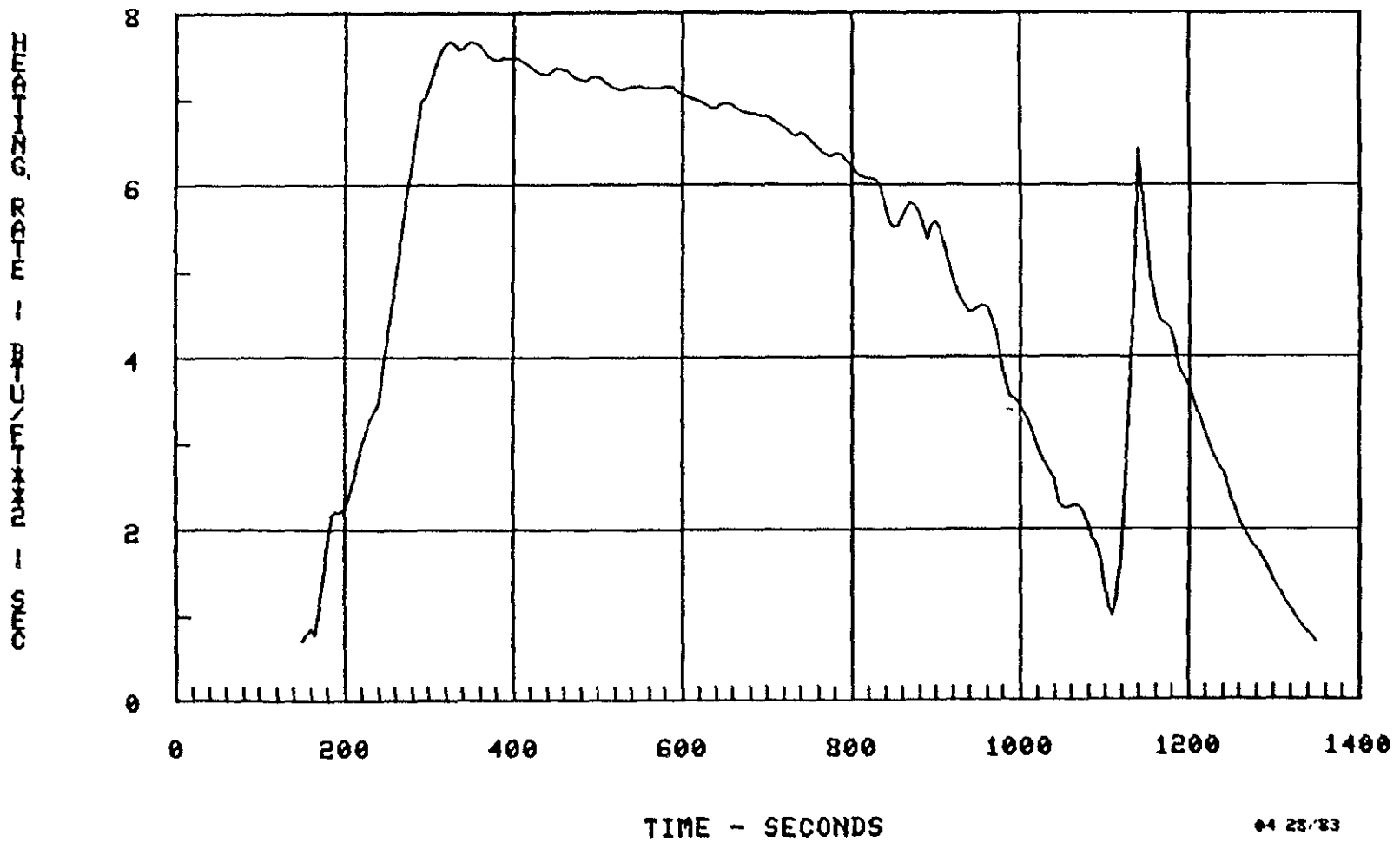
TIME - SECONDS

05/02/83

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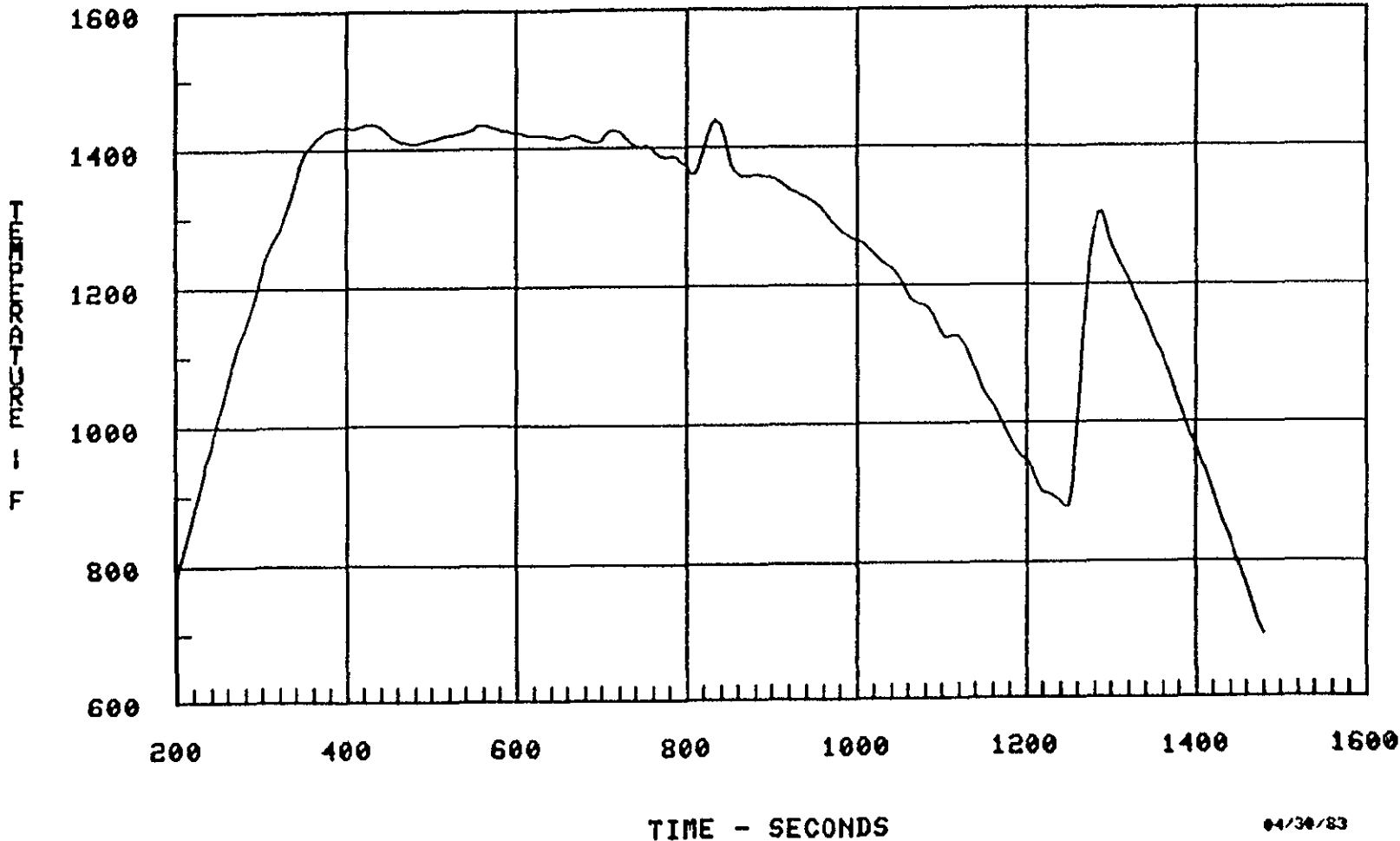


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## STS-2 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

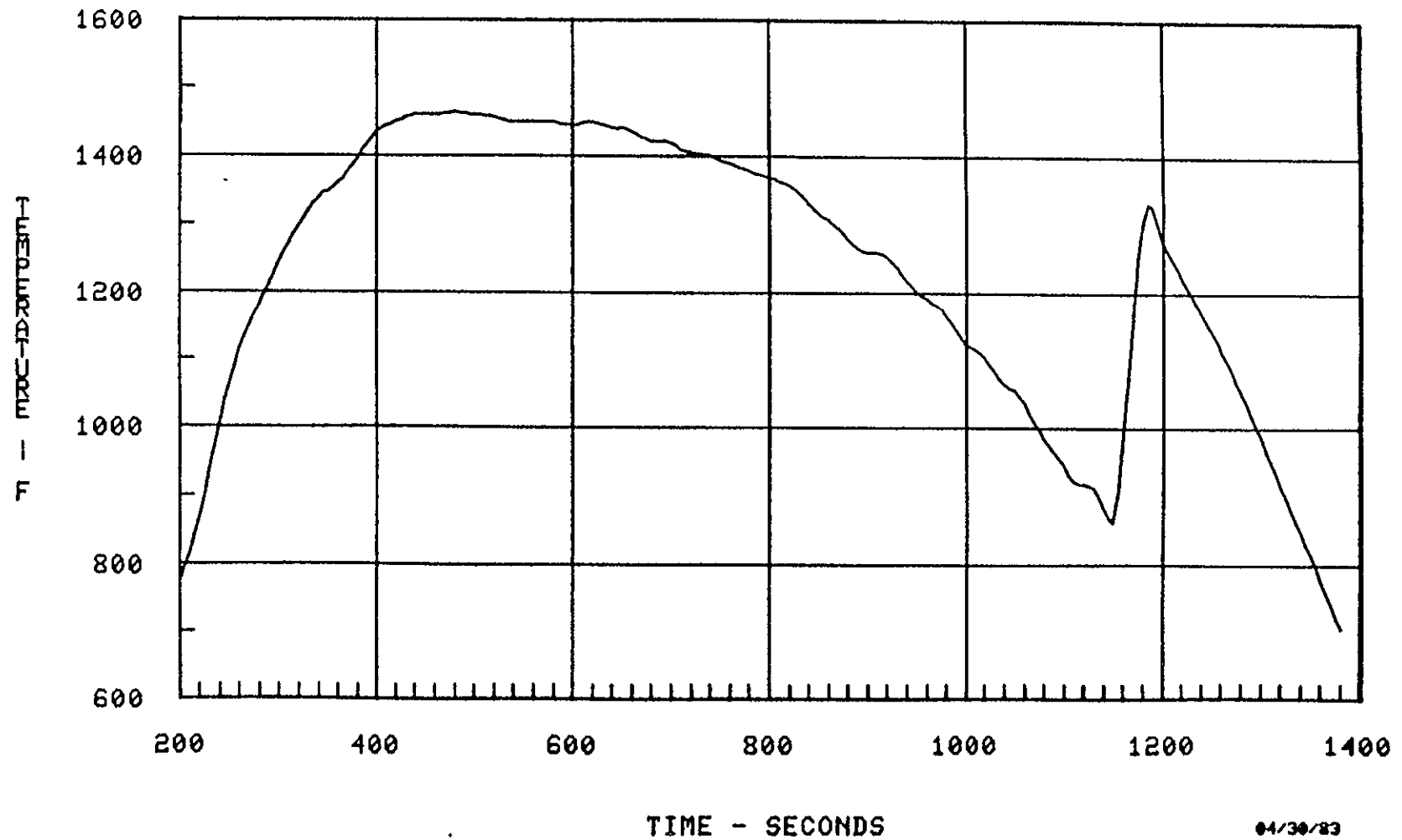
U07T9478A



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# STS-3 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

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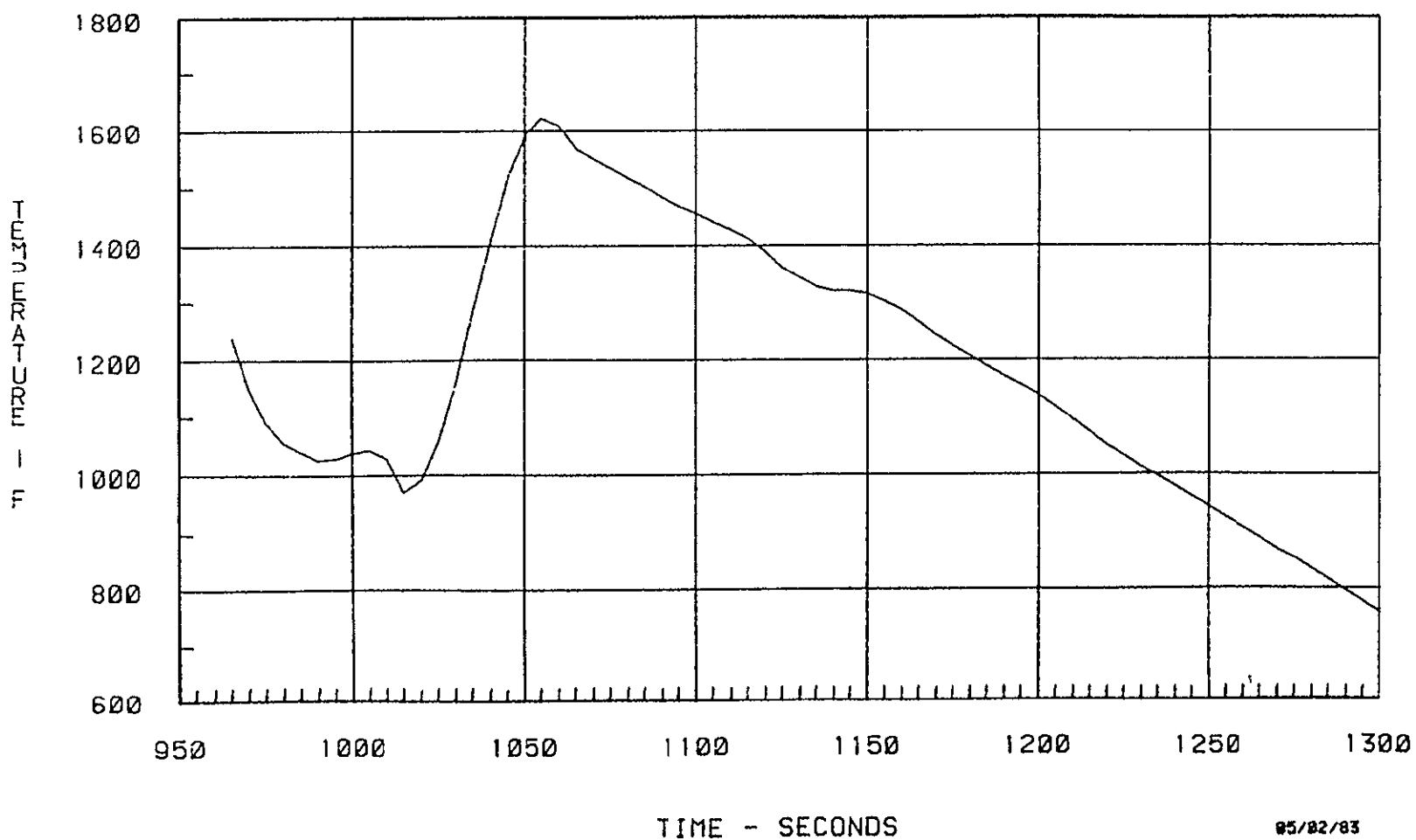
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04/30/83



# STS-4 (107 FT LENGTH CL $X/L=0.60$ ) FLIGHT PARAMETER COMPARISO

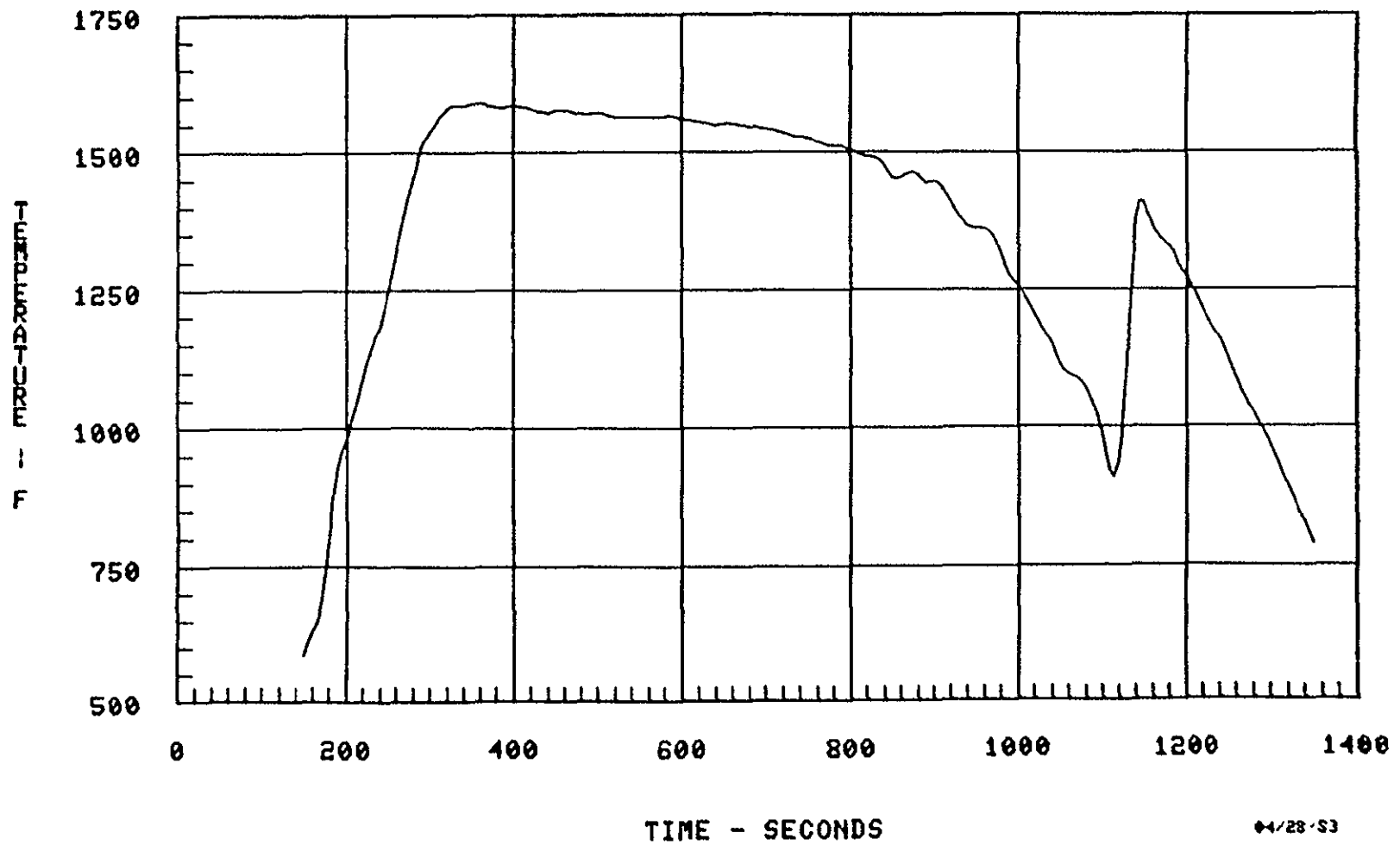
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# STS-5 (107 FT LENGTH CL X/L=0.60) FLIGHT PARAMETER COMPARISO

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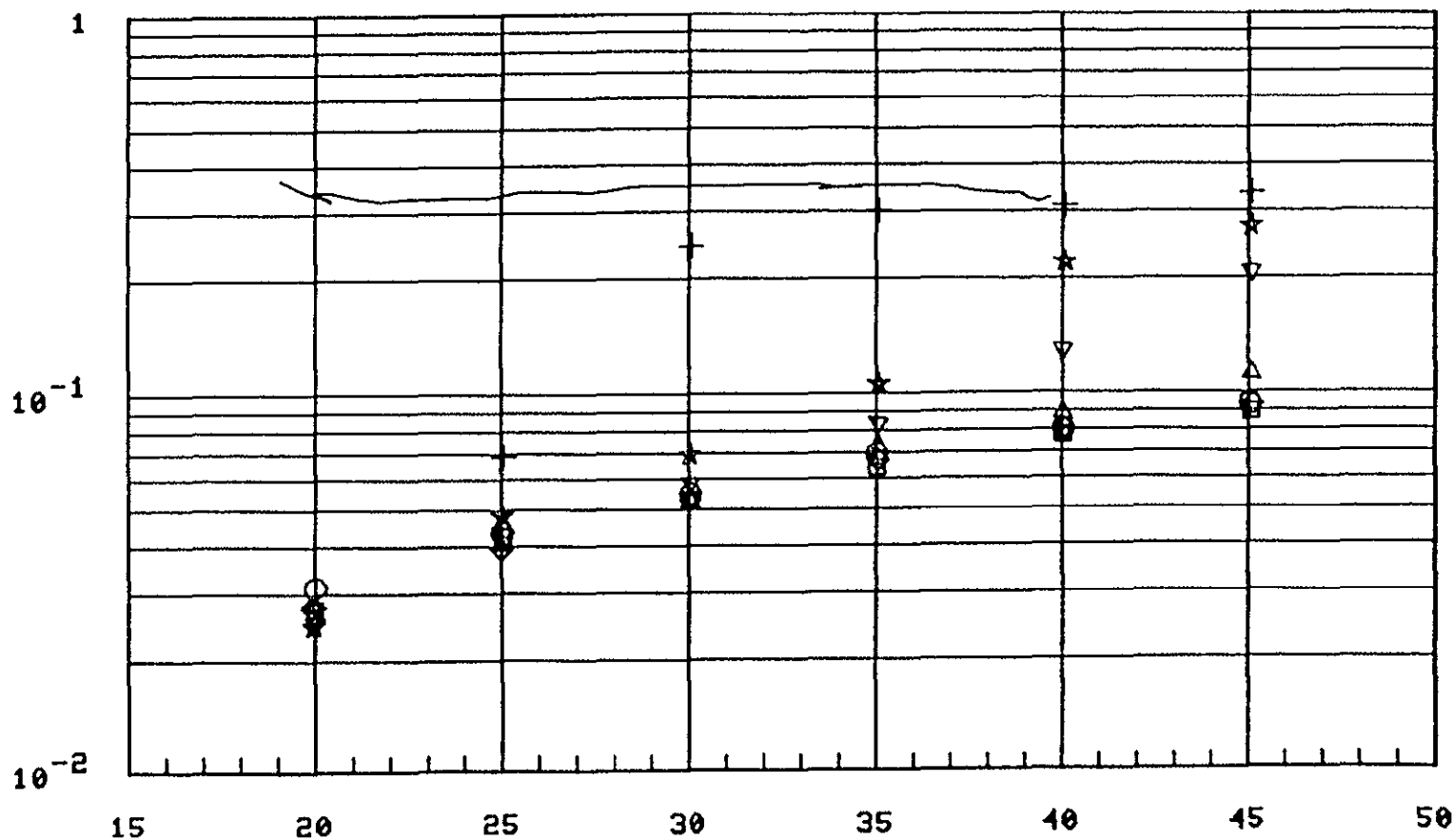
# ST5-1 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISSO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U87T9481A/H-REF 1065-1460 SEC

LINE COUNT - INTERVAL



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B-251

ANGLE-OF-ATTACK - DEG

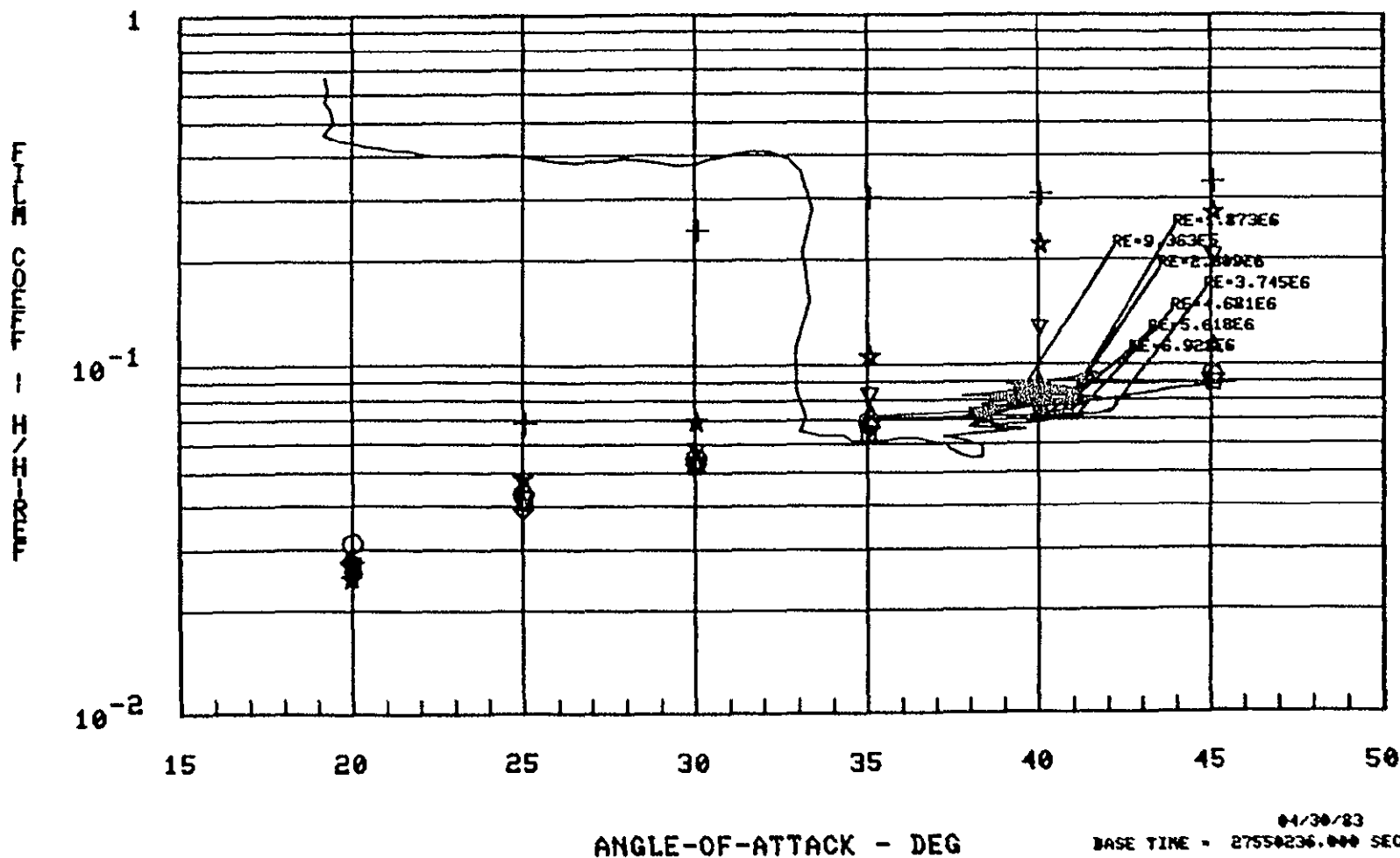
04/30/83  
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# STS-2 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9481A/H-REF 200-1480 SEC



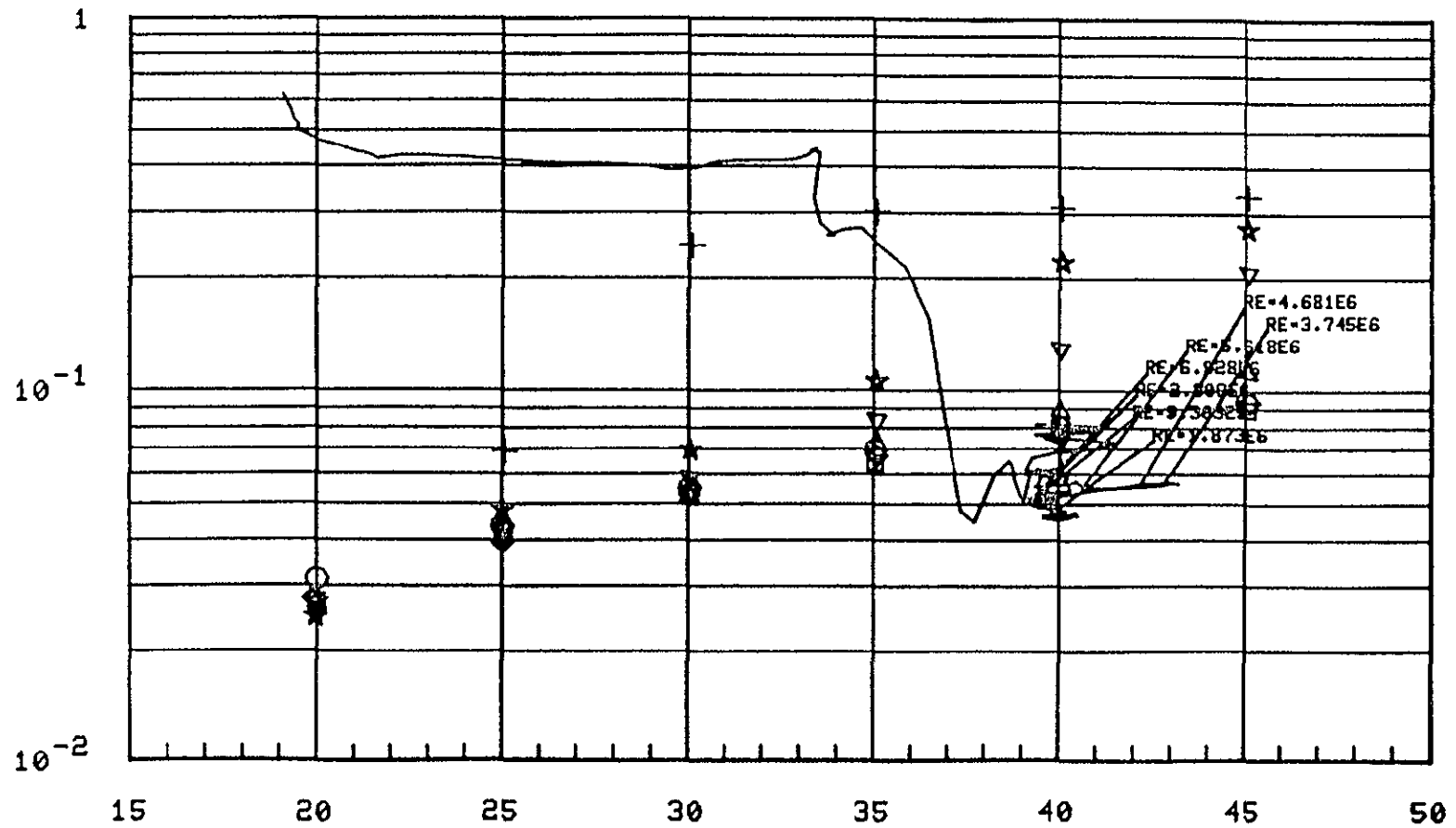
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# STS-3 (107 FT LENGTH CL $X/L=0.69$ ) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
 OH49 0.0175 SCALE RE = 1.0 E06  
 OH49 0.0175 SCALE RE = 1.5 E06  
 OH49 0.0175 SCALE RE = 2.0 E06  
 OH49 0.0175 SCALE RE = 2.5 E06  
 OH49 0.0175 SCALE RE = 3.0 E06  
 OH49 0.0175 SCALE RE = 3.7 E06

U07T9481A/H-REF 200-1380 SEC



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ANGLE-OF-ATTACK - DEG

04/30/83  
 BASE TIME = 07745684.000 SEC.

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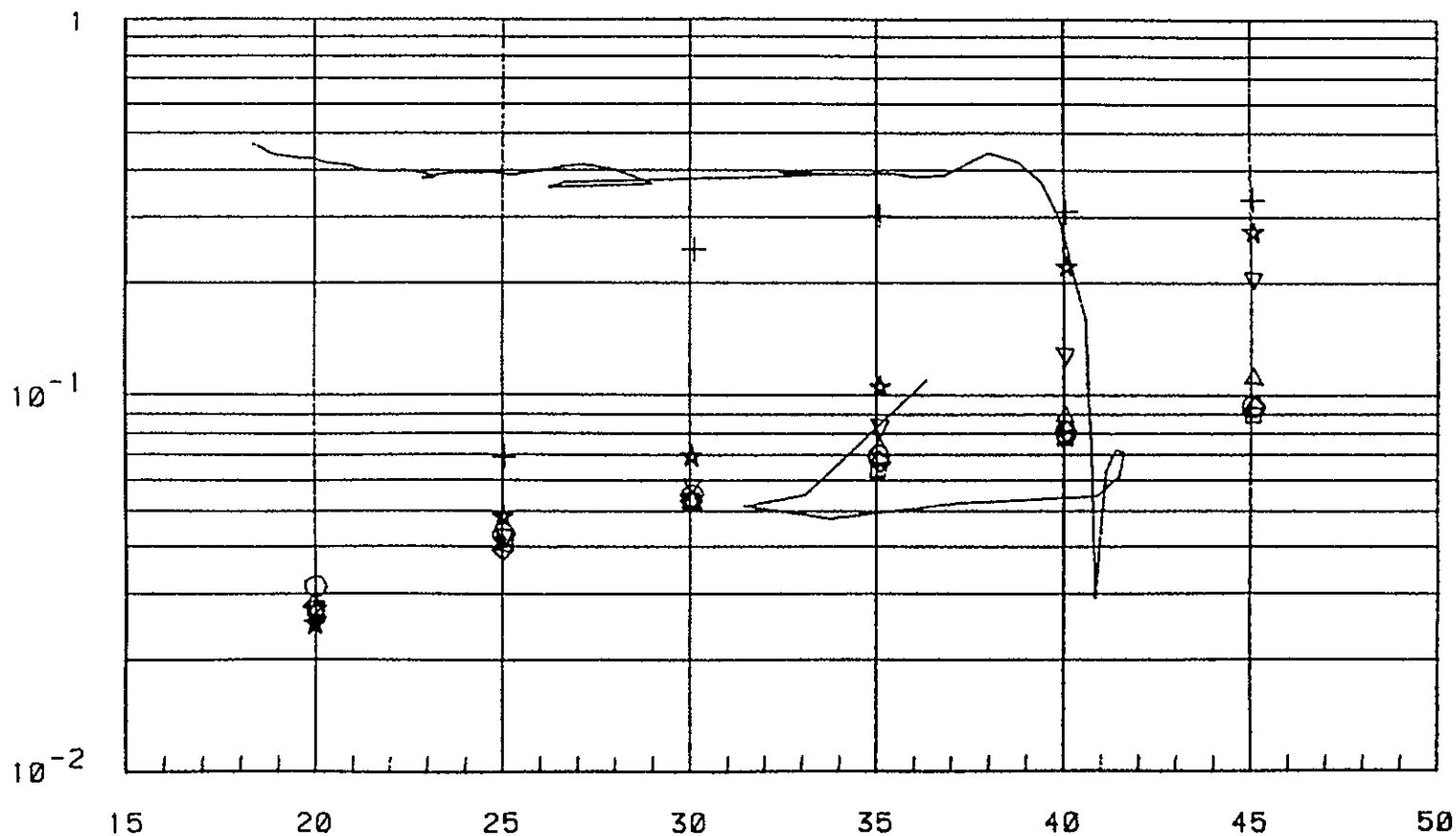
# STS-4 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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OH49 0 0175 SCALE RE = 0.5 E06  
OH49 0 0175 SCALE RE = 1.0 E06  
OH49 0 0175 SCALE RE = 1.5 E06  
OH49 0 0175 SCALE RE = 2.0 E06  
OH49 0 0175 SCALE RE = 2.5 E06  
OH49 0 0175 SCALE RE = 3.0 E06  
OH49 0 0175 SCALE RE = 3.7 E06

V07T0481A/H-REF 985-1300 SEC

LINE COLUMN - T/I-RULE



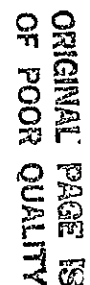
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ANGLE-OF-ATTACK - DEG

85/02/83  
BASE TIME = 16040423.000 SEC.

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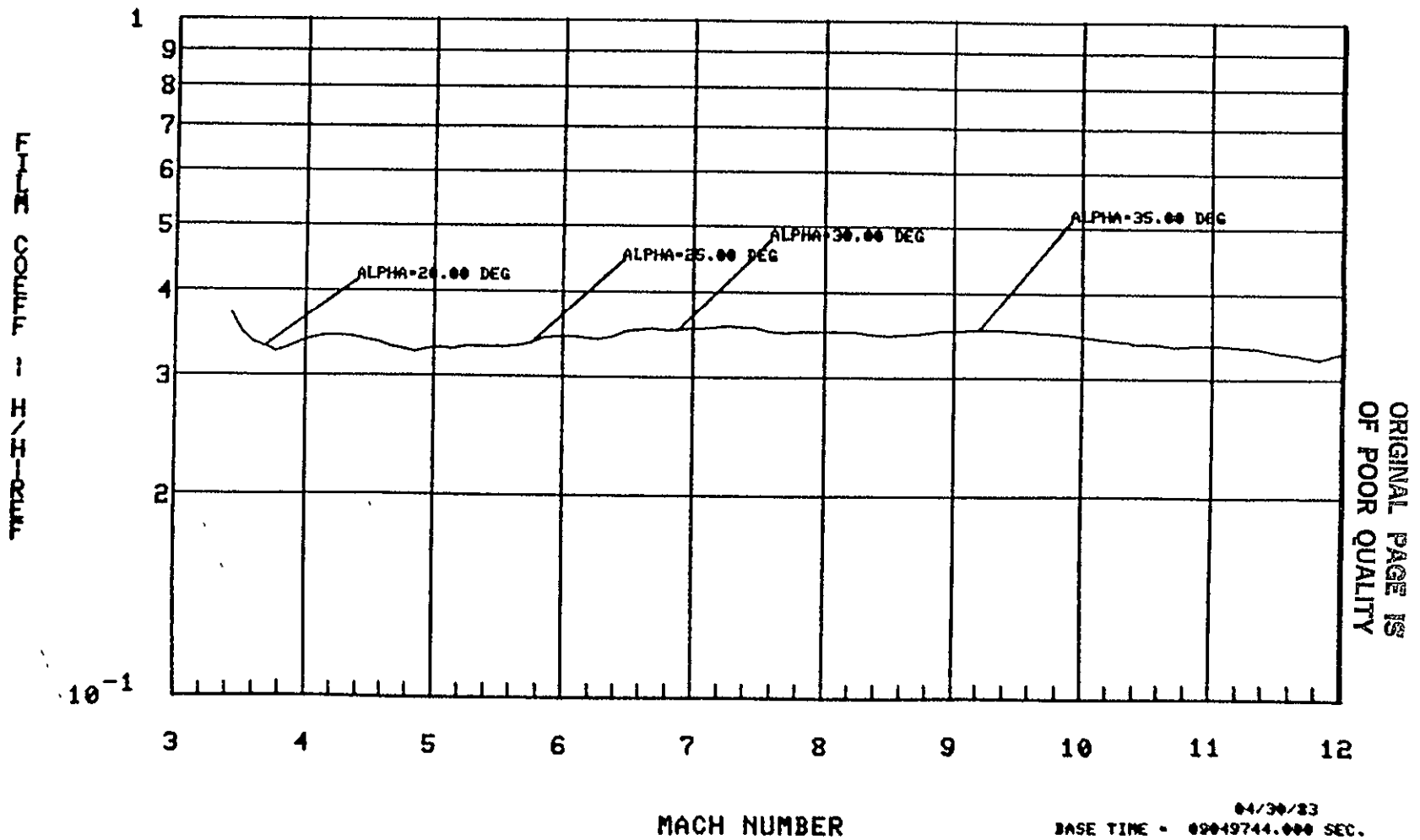
U07T9481A/H-REF 150-1350 SEC



B-255

# STS-1 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

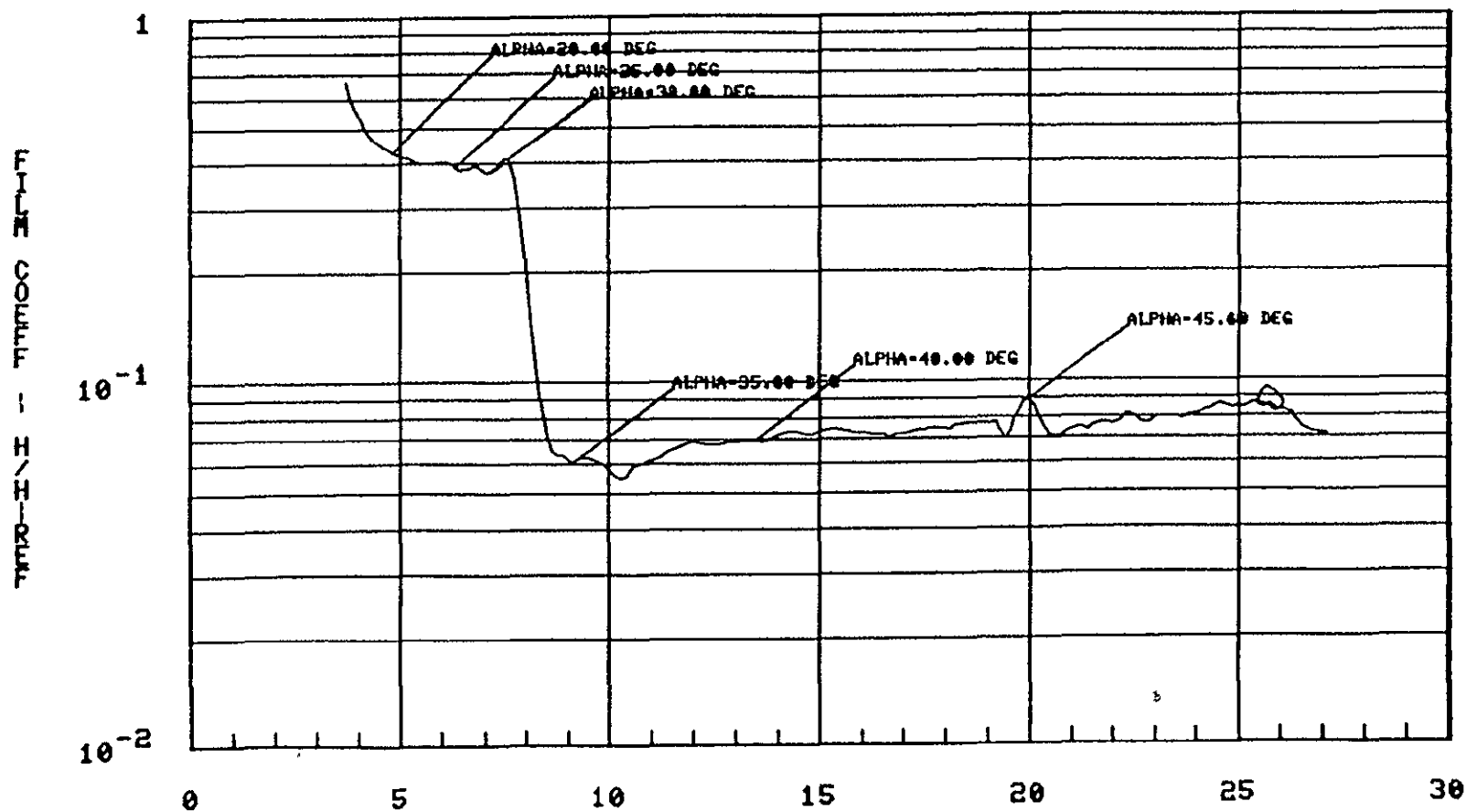
U07T9481A/H-REF 1065-1460 SEC





# STS-2 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A/H-REF 200-1480 SEC



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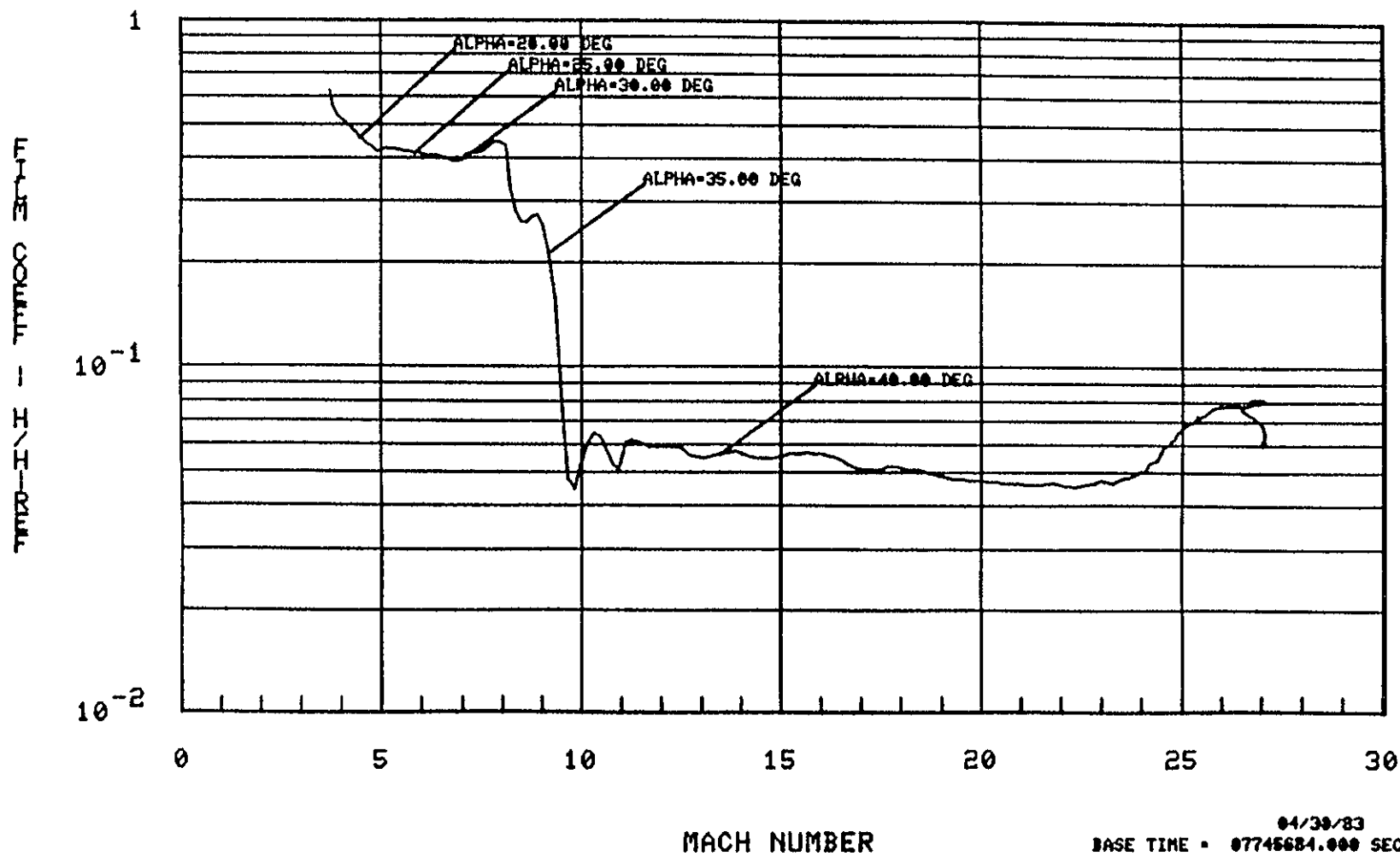
B-257

MACH NUMBER

04/30/83  
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# STS-3 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A/H-REF 200-1380 SEC

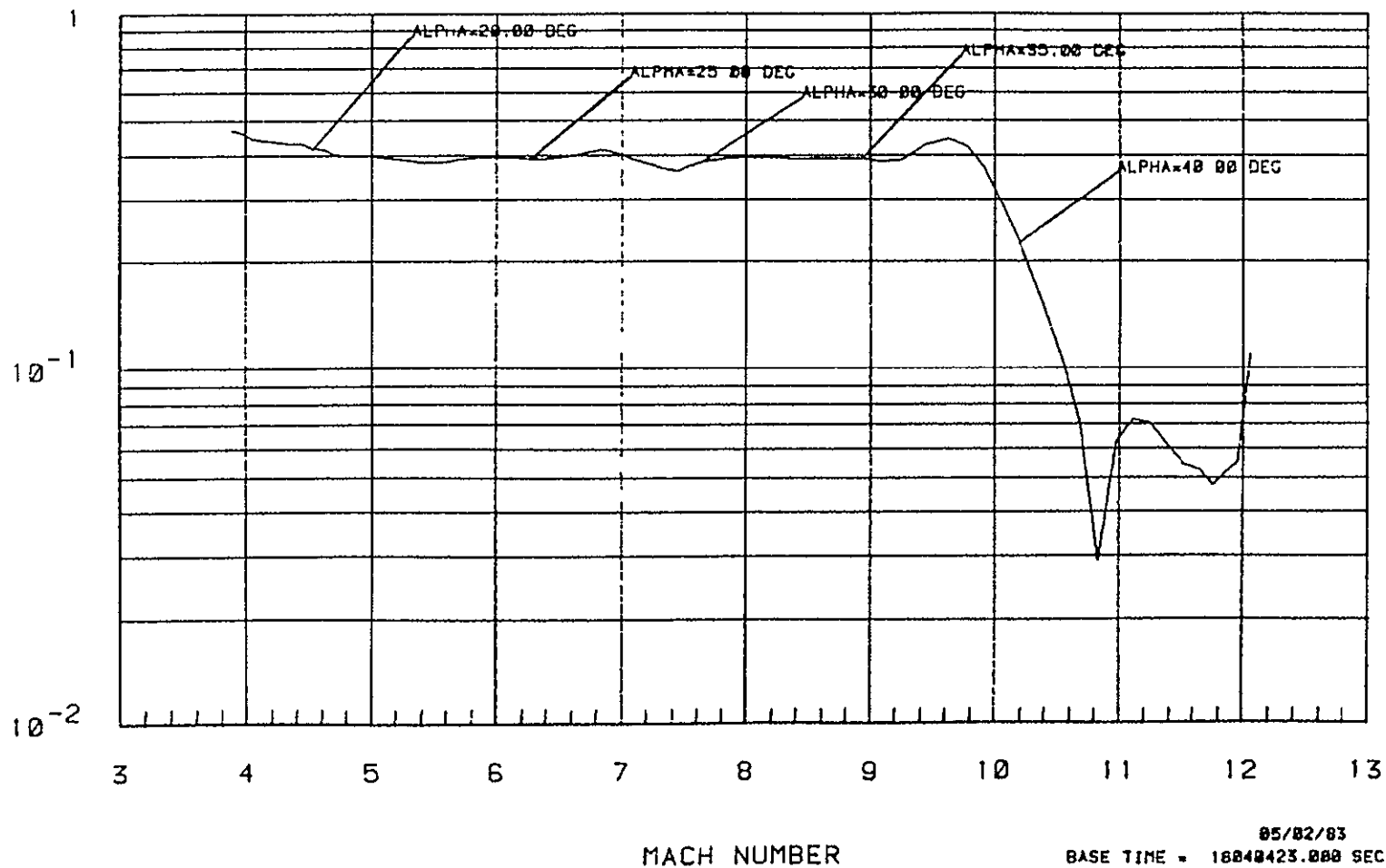


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# STS-4 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

V07T0481A/H-REF 065-1300 SEC

TIME CORRECTION - H/I-0000



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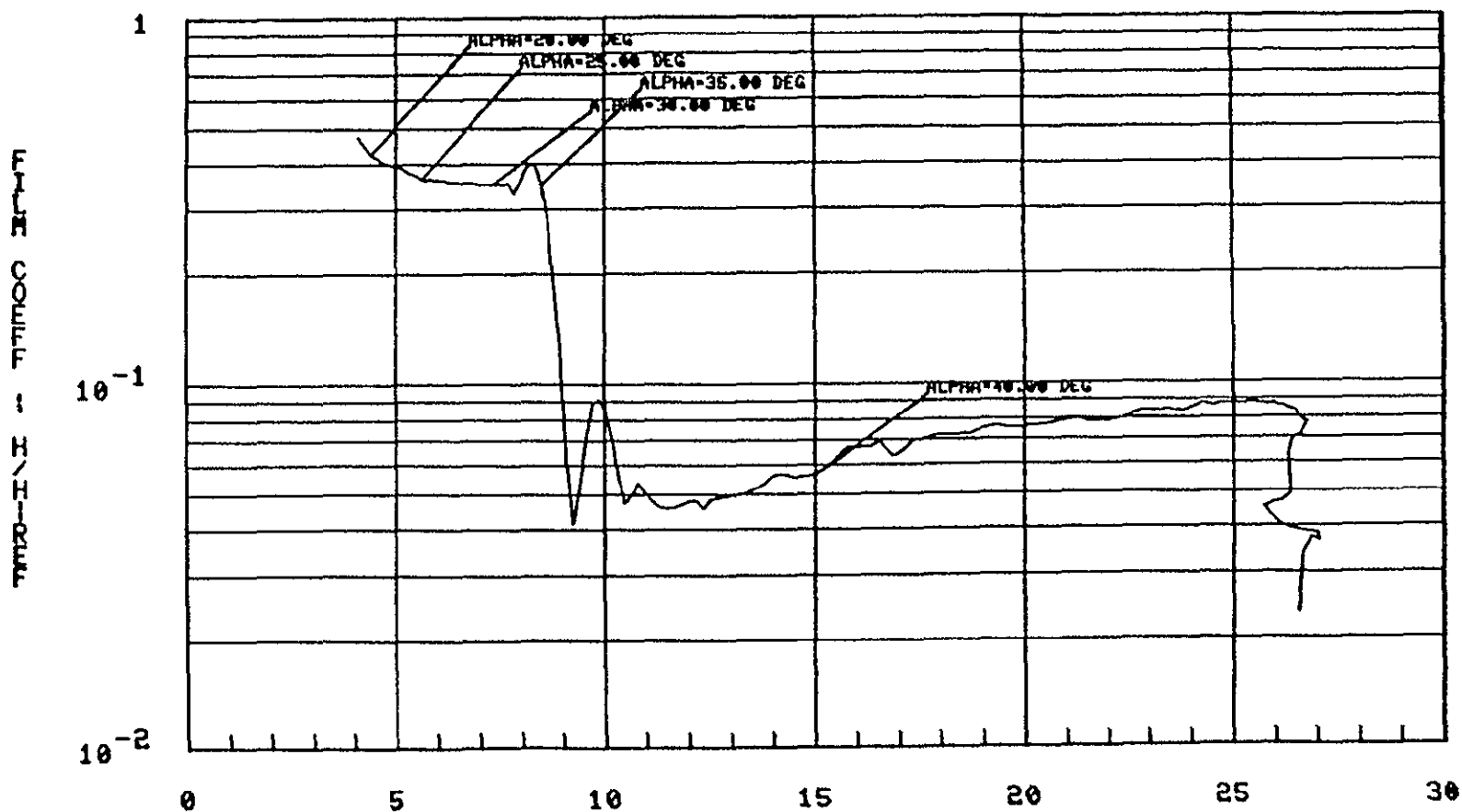
B-259

05/02/83

BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A/H-REF 150-1350 SEC



B-260

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MACH NUMBER

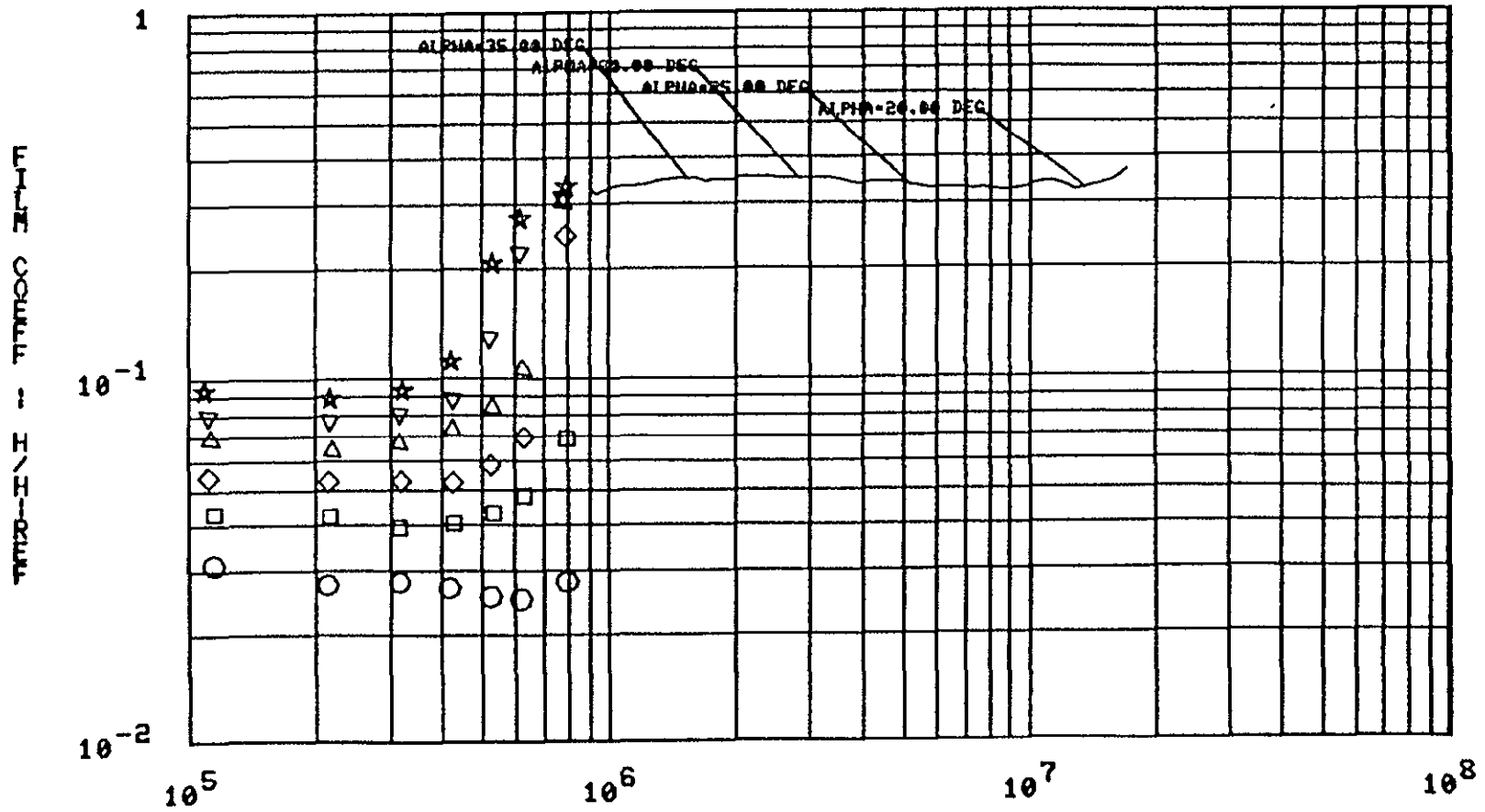
04/28/83  
BASE TIME • 27698591.000 SEC.

# STS-1 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U0779481A/H-REF 1065-1460 SEC



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B-261

REYNOLDS NUMBER (NS)

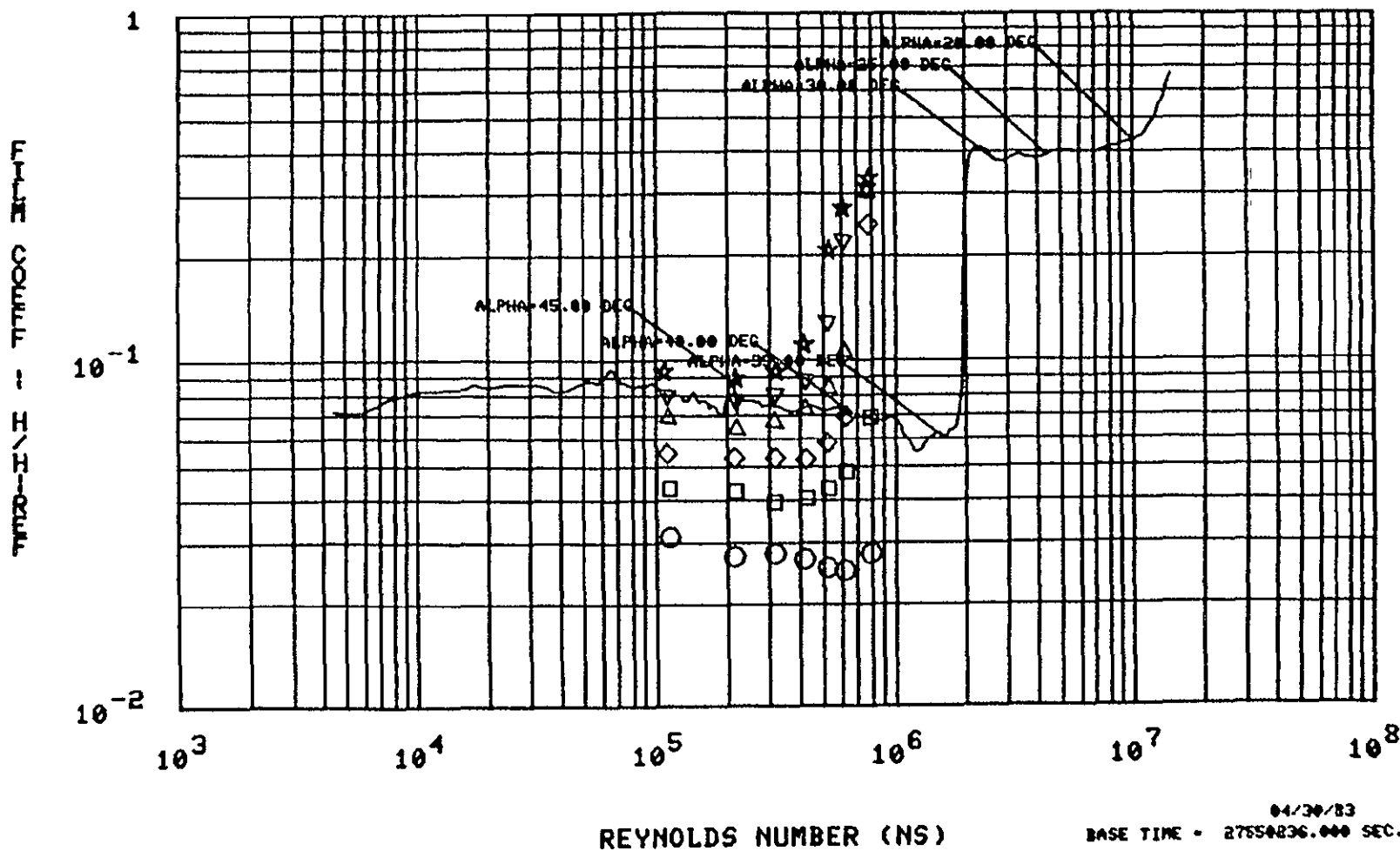
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# STS-2 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISON

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U0779481A/H-REF 200-1480 SEC



B-252

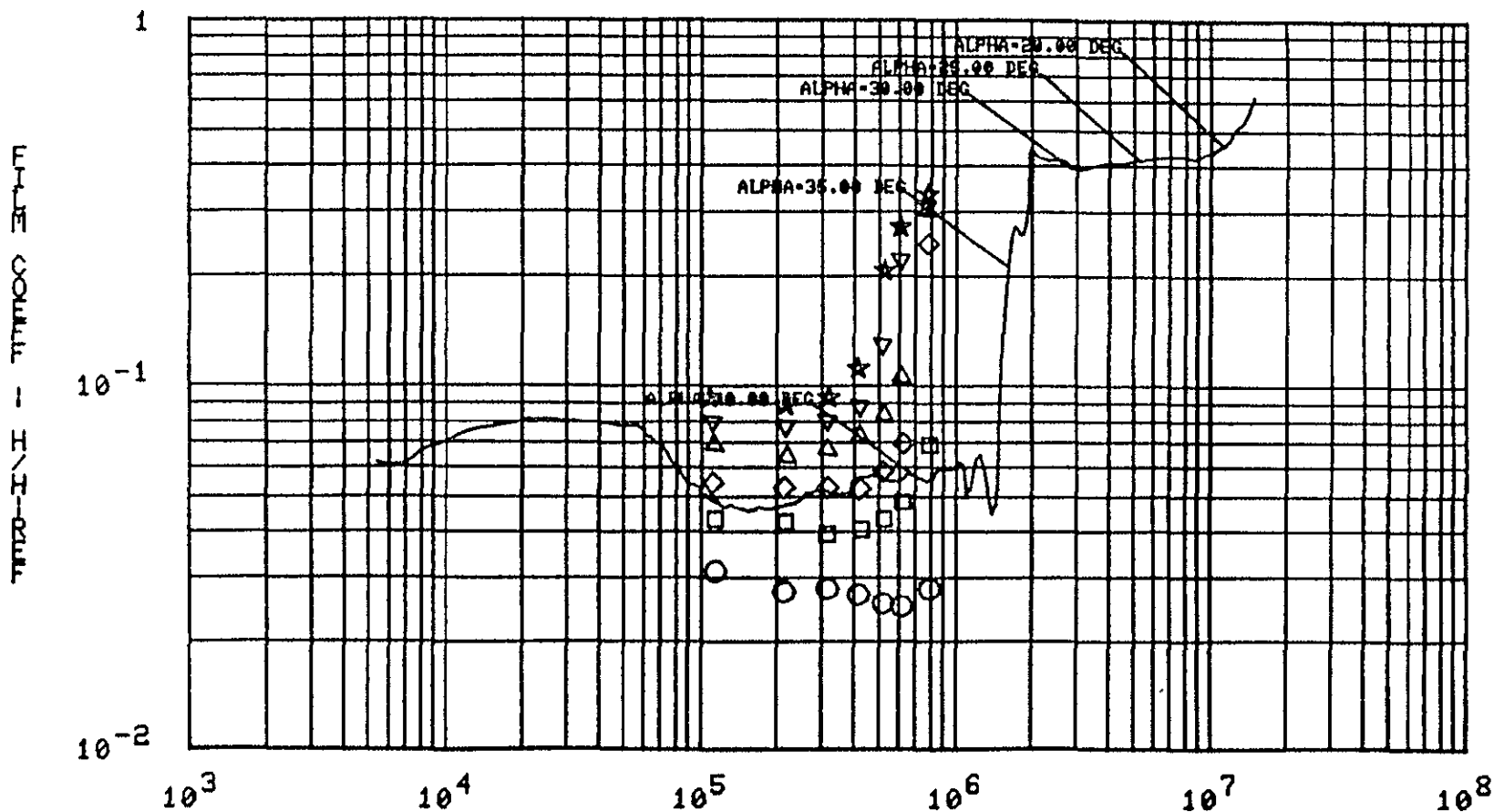
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# STS-3 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA • 20 DEGREES  
OH49 ALPHA • 25 DEGREES  
OH49 ALPHA • 30 DEGREES  
OH49 ALPHA • 35 DEGREES  
OH49 ALPHA • 40 DEGREES  
OH49 ALPHA • 45 DEGREES

U07T9481A/H-REF 200-1380 SEC



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B-263

REYNOLDS NUMBER (NS)

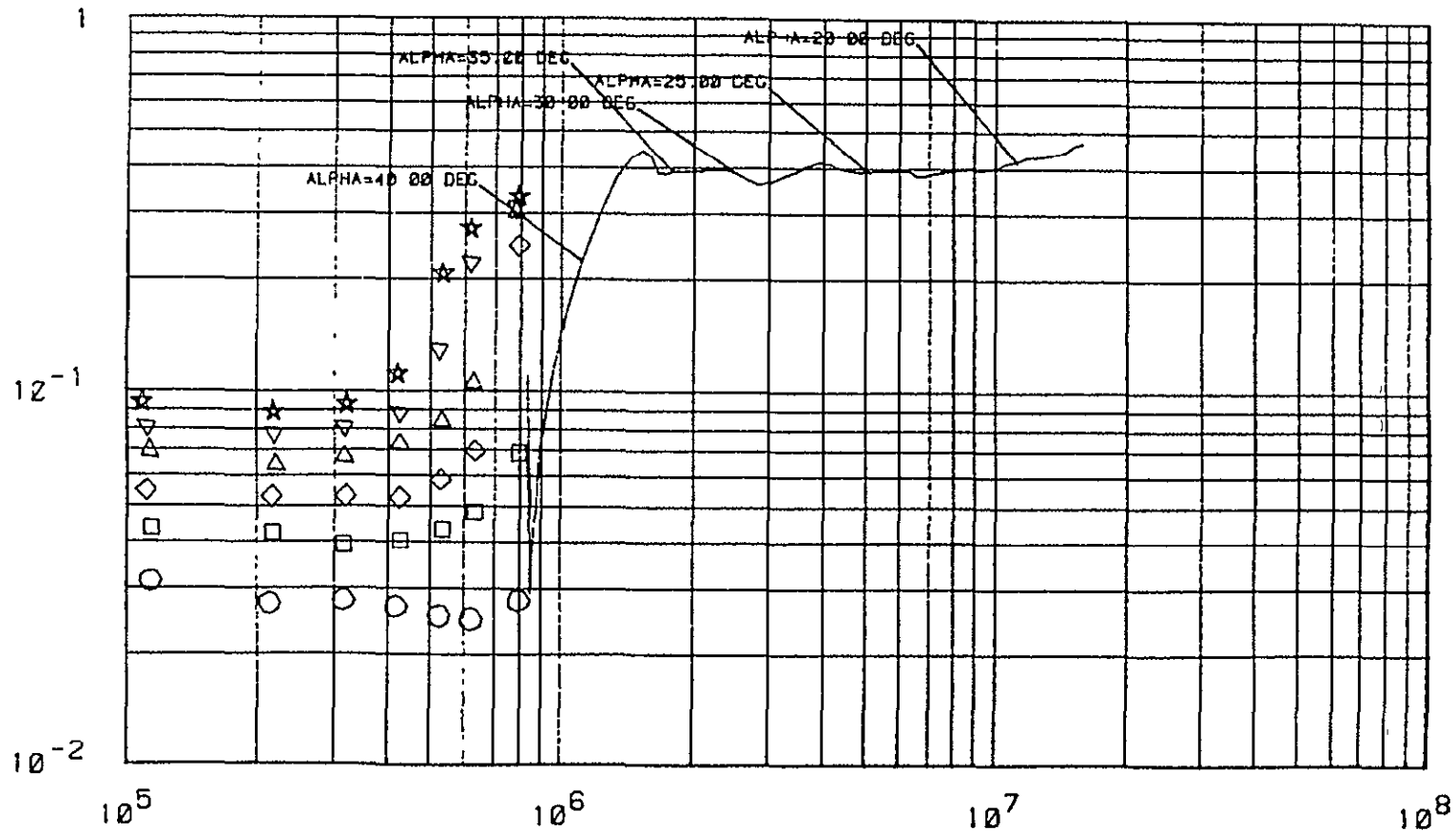
04/30/83  
BASE TIME • 07745684.000 SEC.

# STS-4 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

○ DH49 ALPHA = 20 DEGREES  
 □ DH49 ALPHA = 25 DEGREES  
 ◇ DH49 ALPHA = 30 DEGREES  
 △ DH49 ALPHA = 35 DEGREES  
 ▽ DH49 ALPHA = 40 DEGREES  
 ★ DH49 ALPHA = 45 DEGREES

V07T0401A/H-REF 065-1300 SEC

WING COEFFICIENT - LIFT-DRAW



REYNOLDS NUMBER (NS)

05/02/83  
BASE TIME = 16040423.000 SEC.

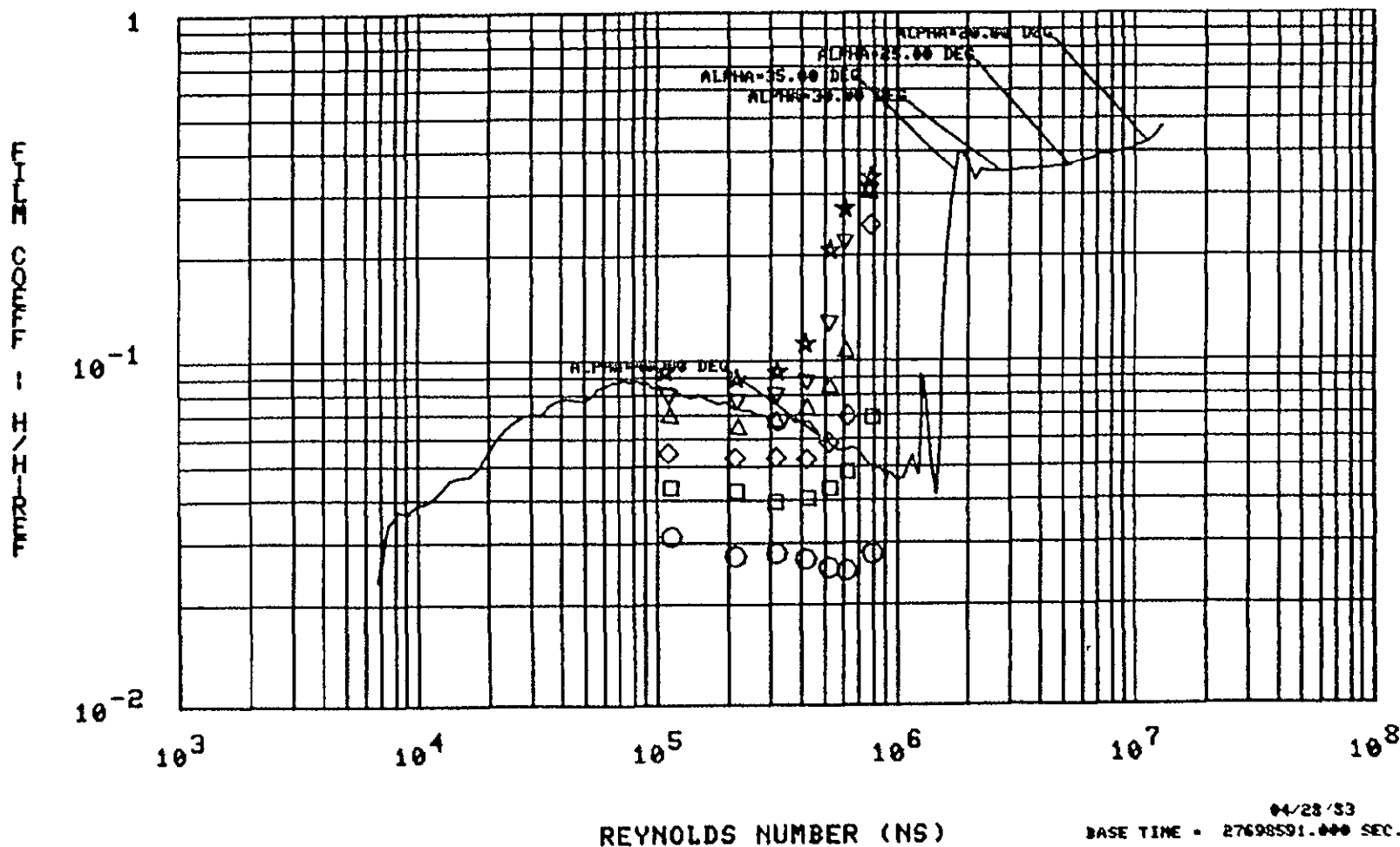
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# STS-5 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

- OH49 ALPHA = 20 DEGREES
- OH49 ALPHA = 25 DEGREES
- ◇ OH49 ALPHA = 30 DEGREES
- △ OH49 ALPHA = 35 DEGREES
- ▽ OH49 ALPHA = 40 DEGREES
- ★ OH49 ALPHA = 45 DEGREES

U07T9481A/H-REF 150-1350 SEC

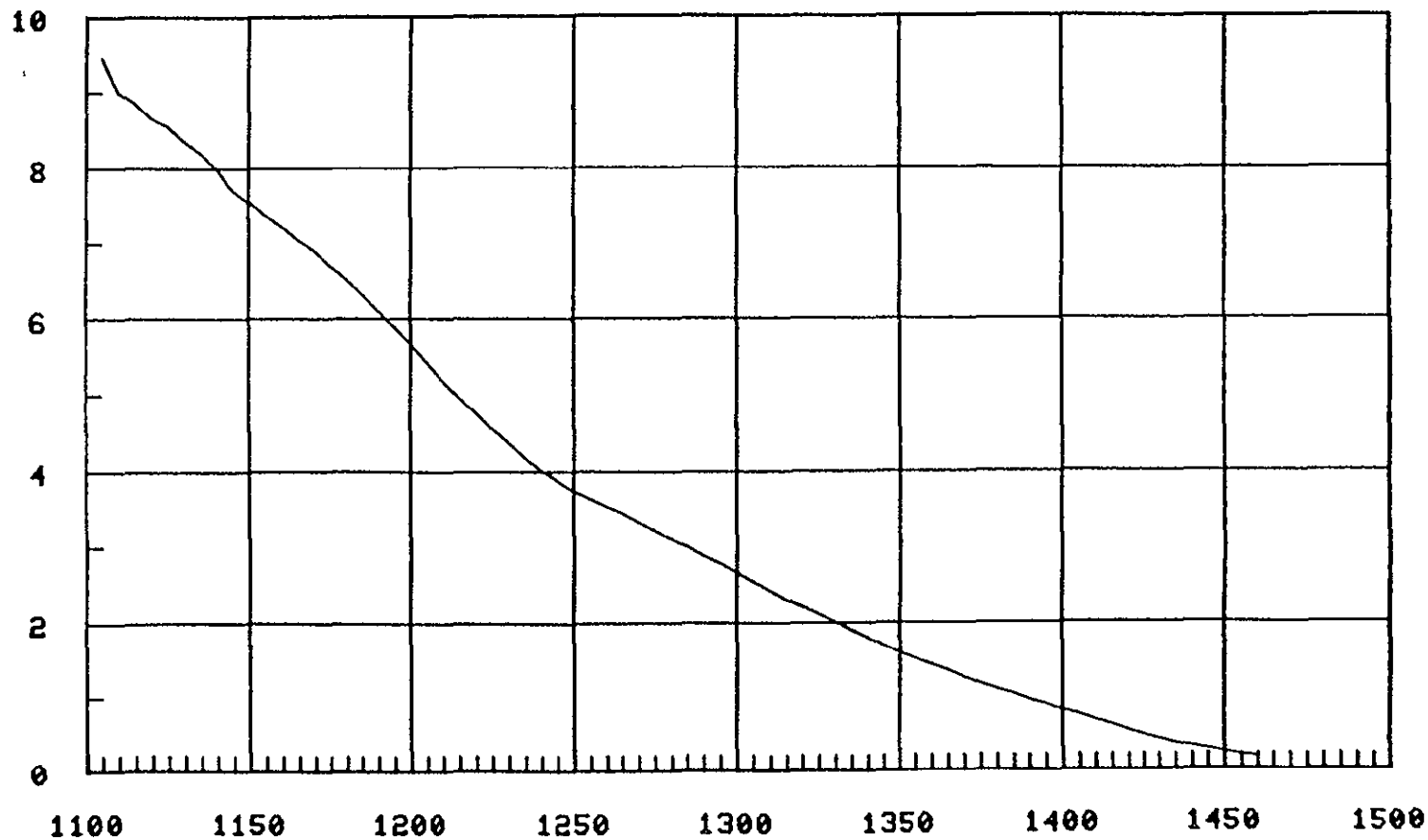


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# STS-1 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U67T9481A

BUCKETING RATE - BTU/FT-MIN - GROSS



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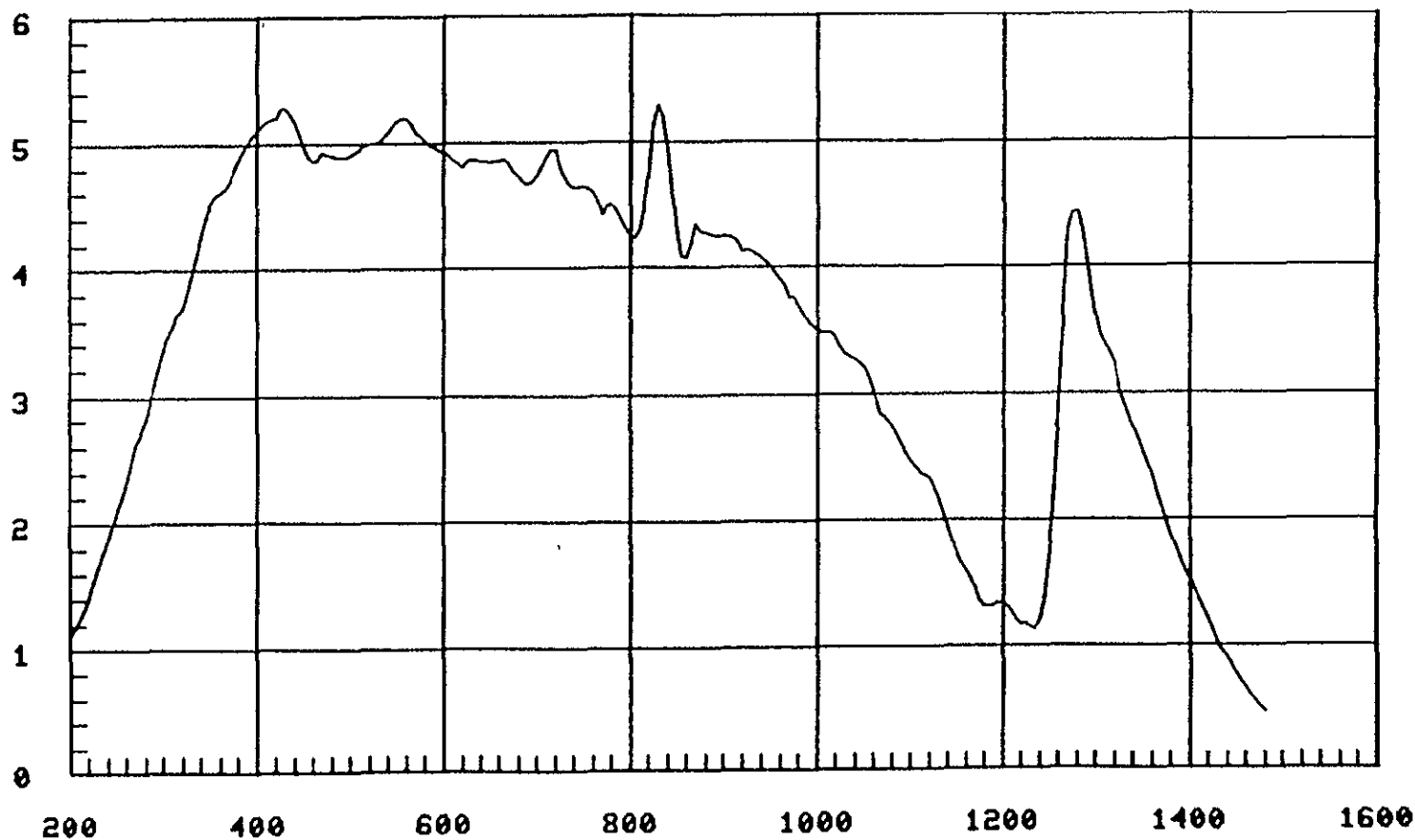
TIME - SECONDS

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A

THICKNESS RATIO - BENDING MOMENT - CURVE



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TIME - SECONDS

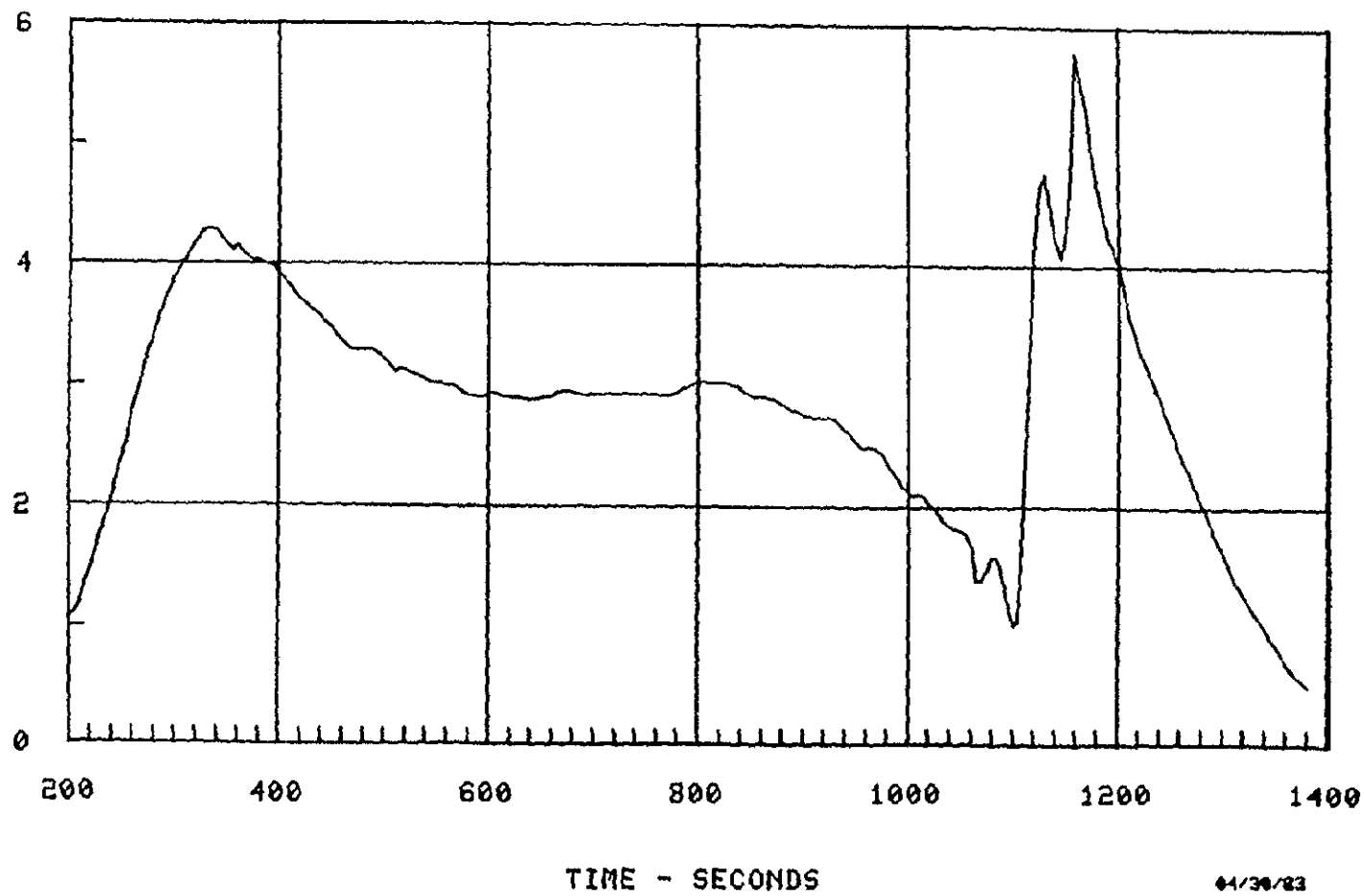
04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A

INSTRUMENT - FIELD - WIND - WIND - WIND

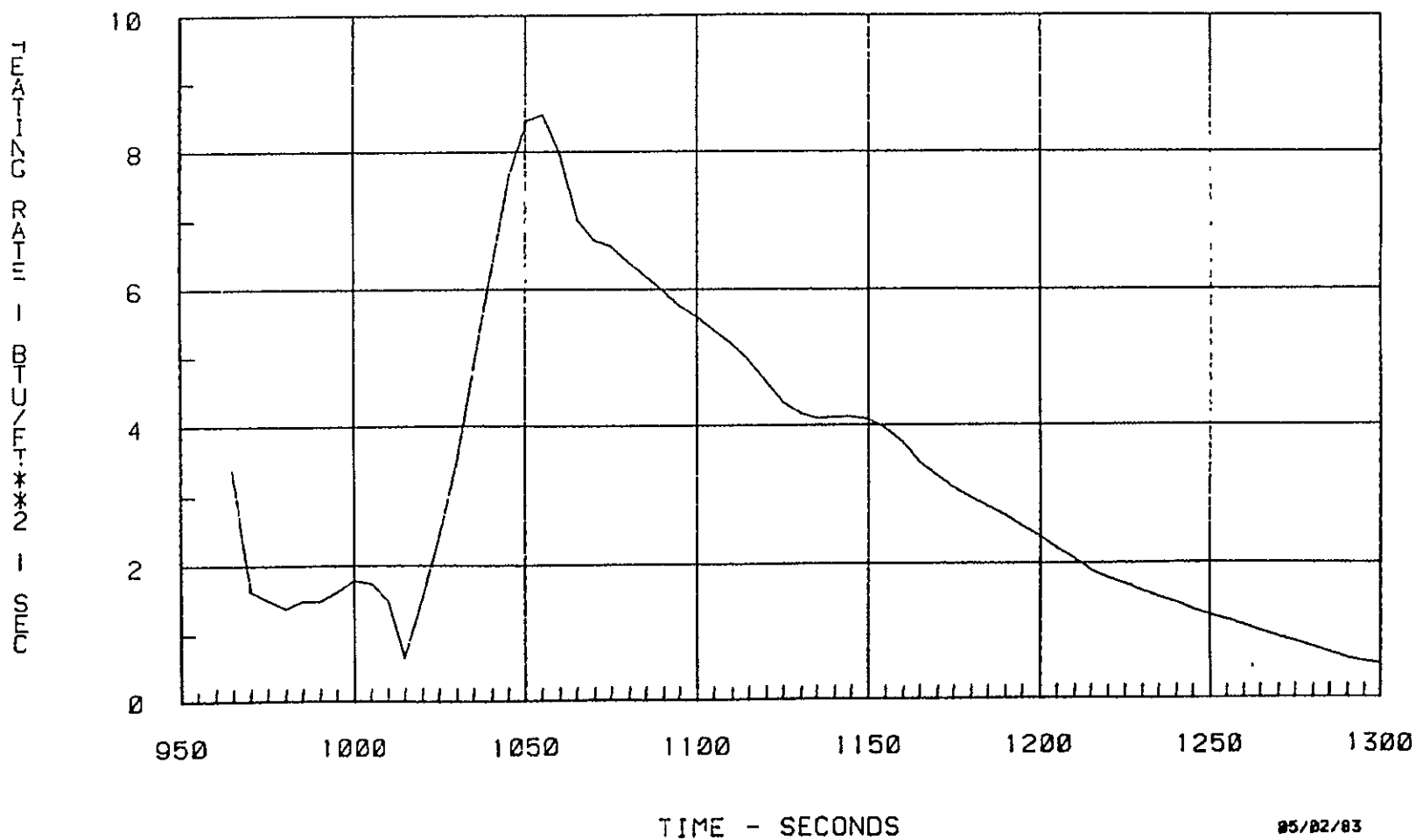
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04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISON

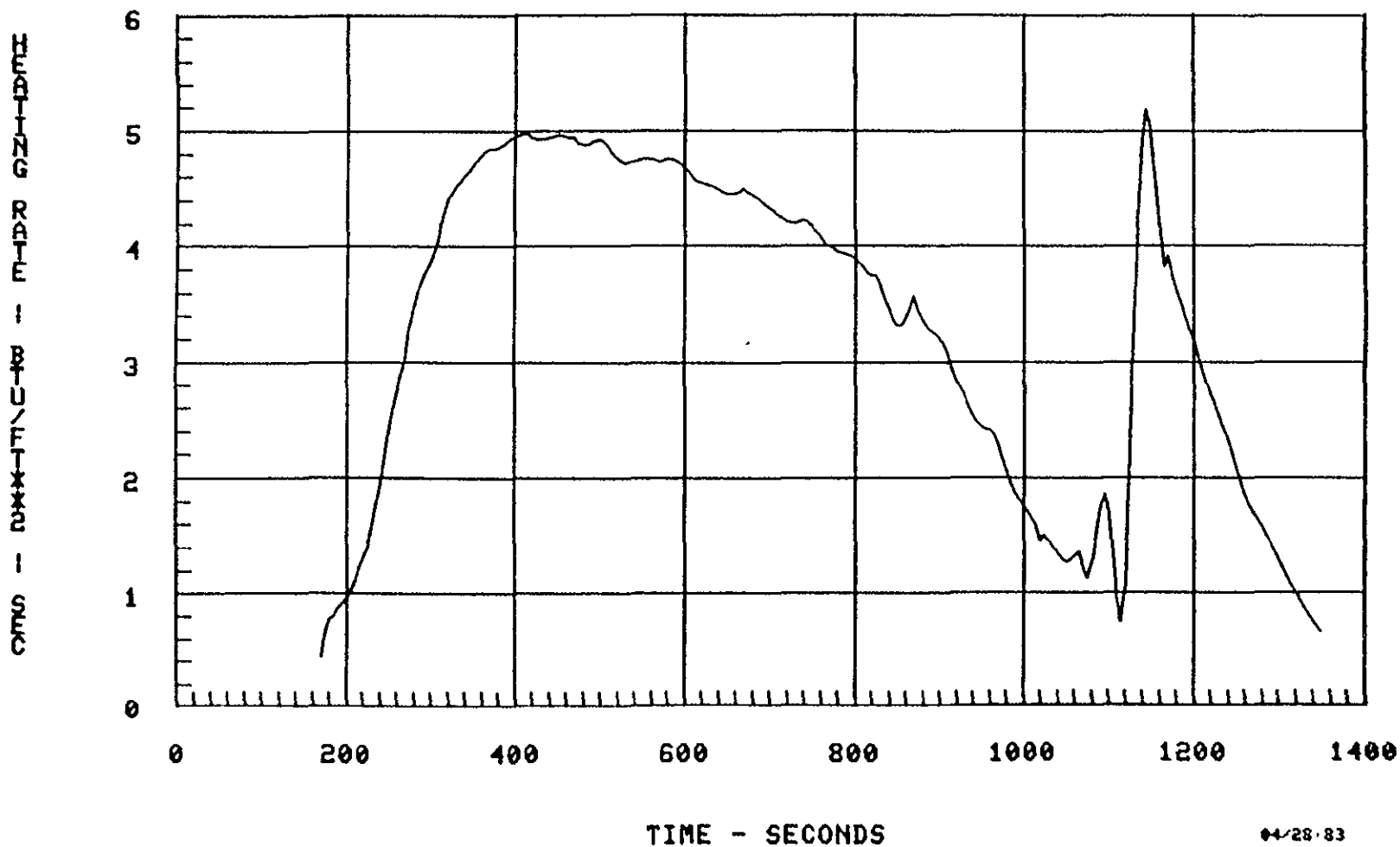
V07T0401A



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# STS-5 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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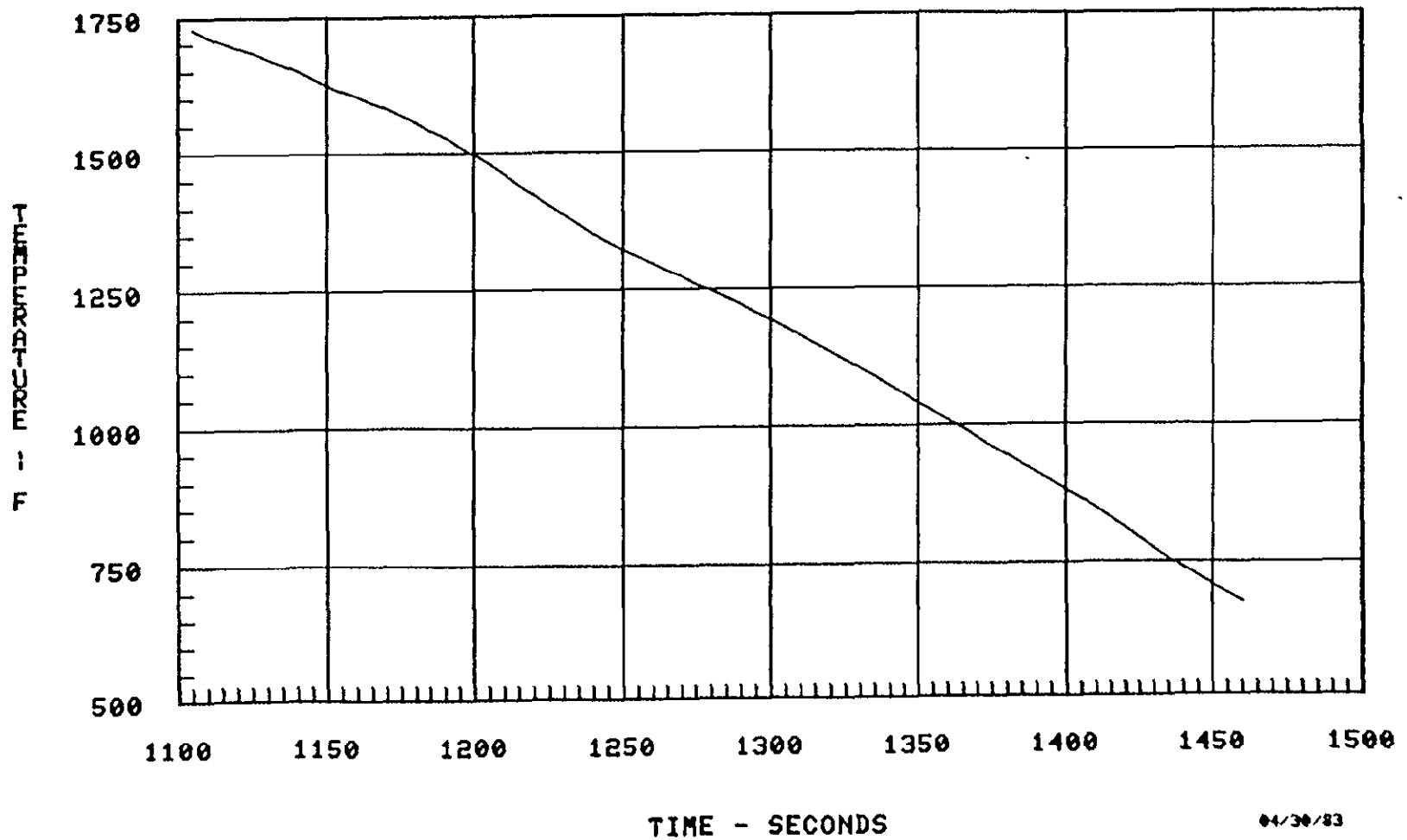
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8-270

04/28/83

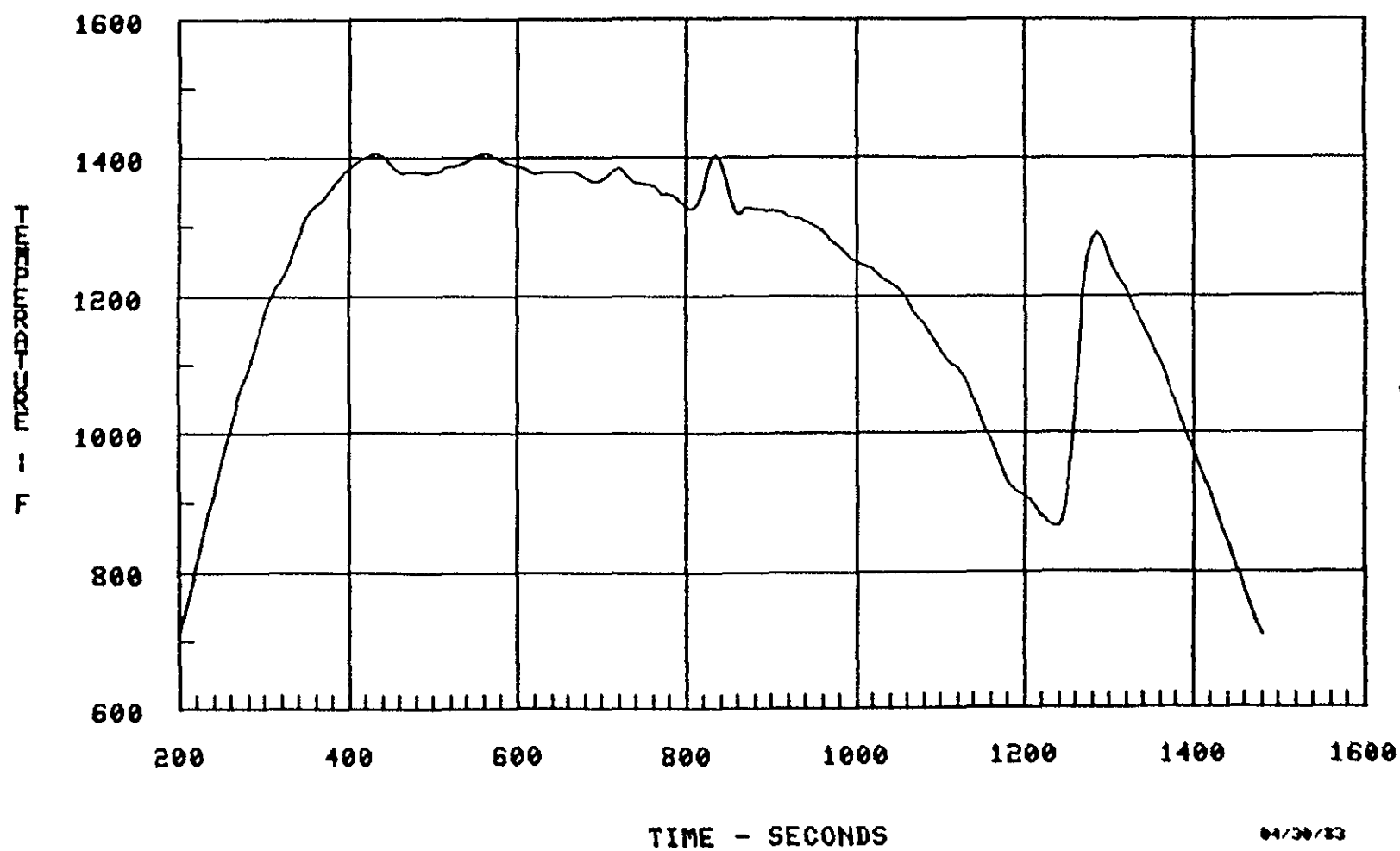
# STS-1 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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# STS-2 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

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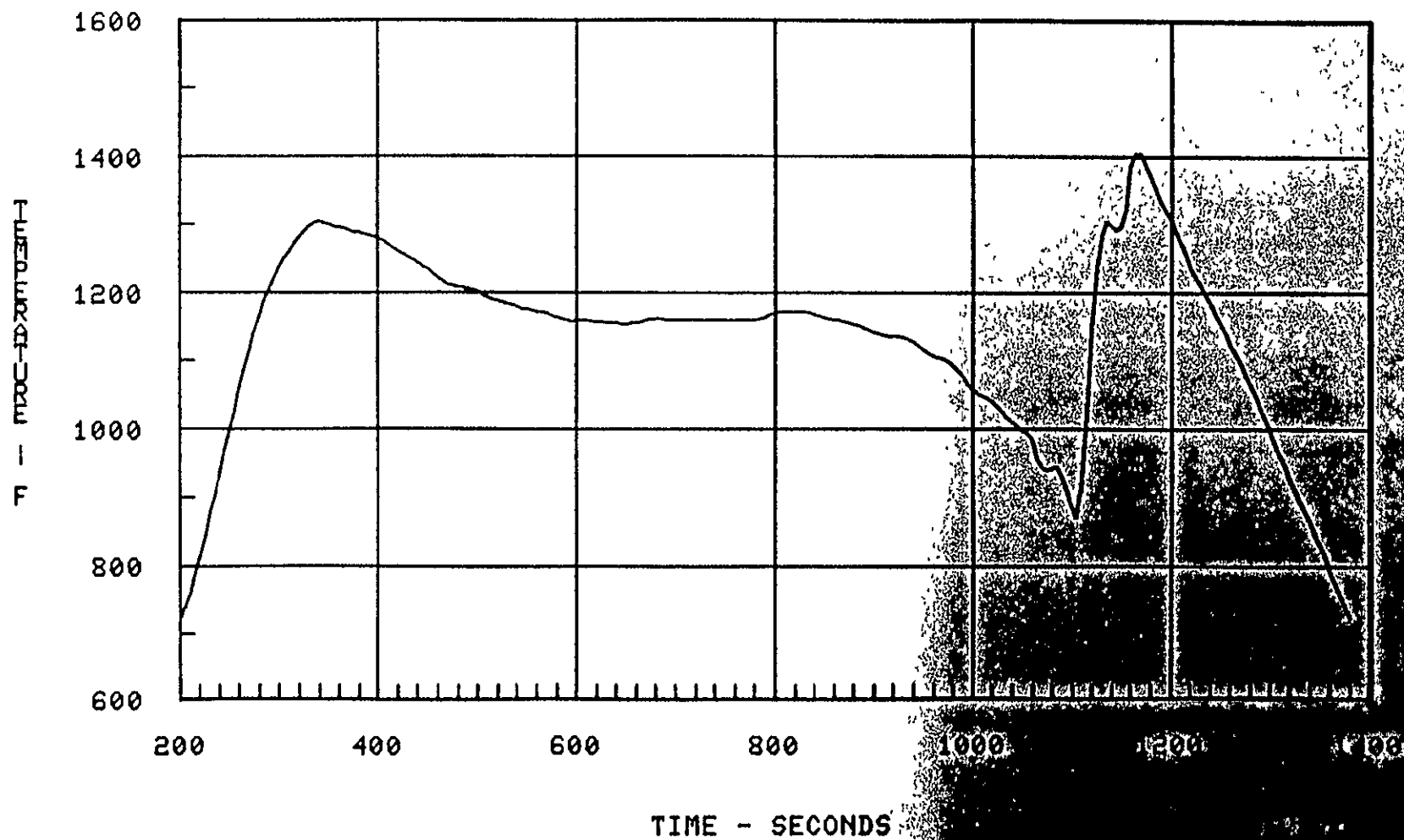
04/30/83

B-272



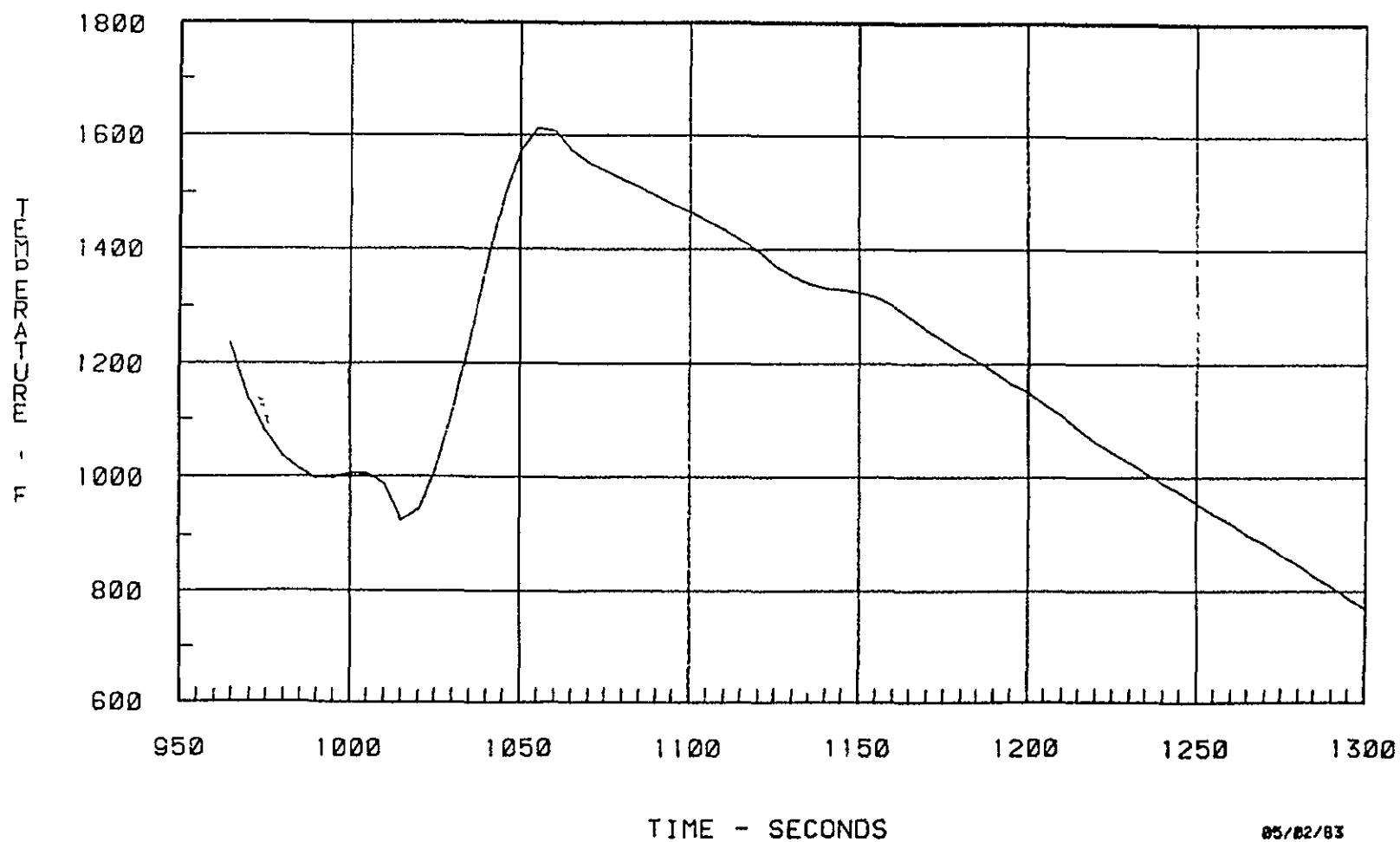
# STS-3 (107 FT LENGTH CL $X/L=0.69$ ) FLIGHT PARAMETER COMPARISO

U07T9481A



# STS-4 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

———— V07T0481A



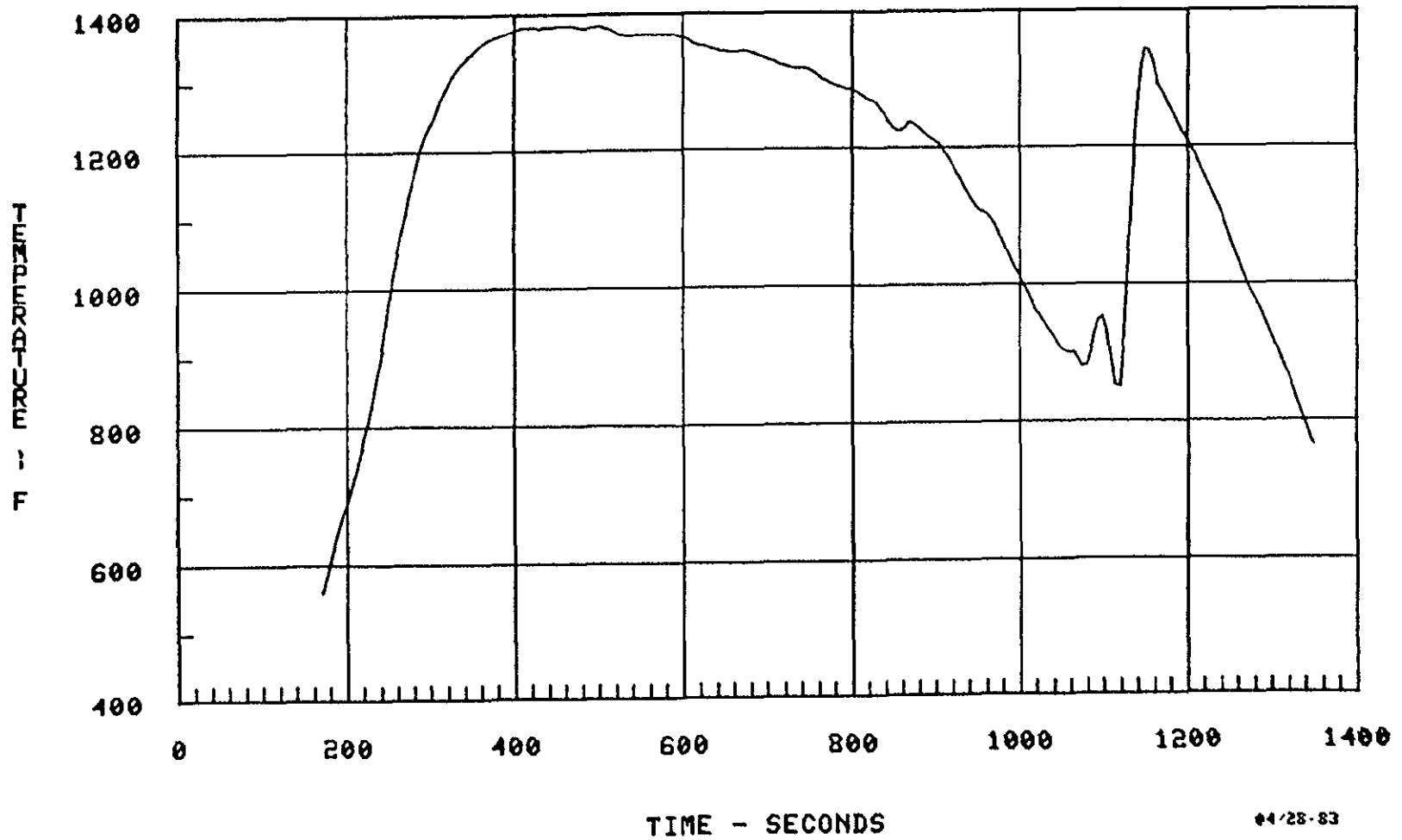
B-274

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05/02/83

# STS-5 (107 FT LENGTH CL X/L=0.69) FLIGHT PARAMETER COMPARISO

U07T9481A



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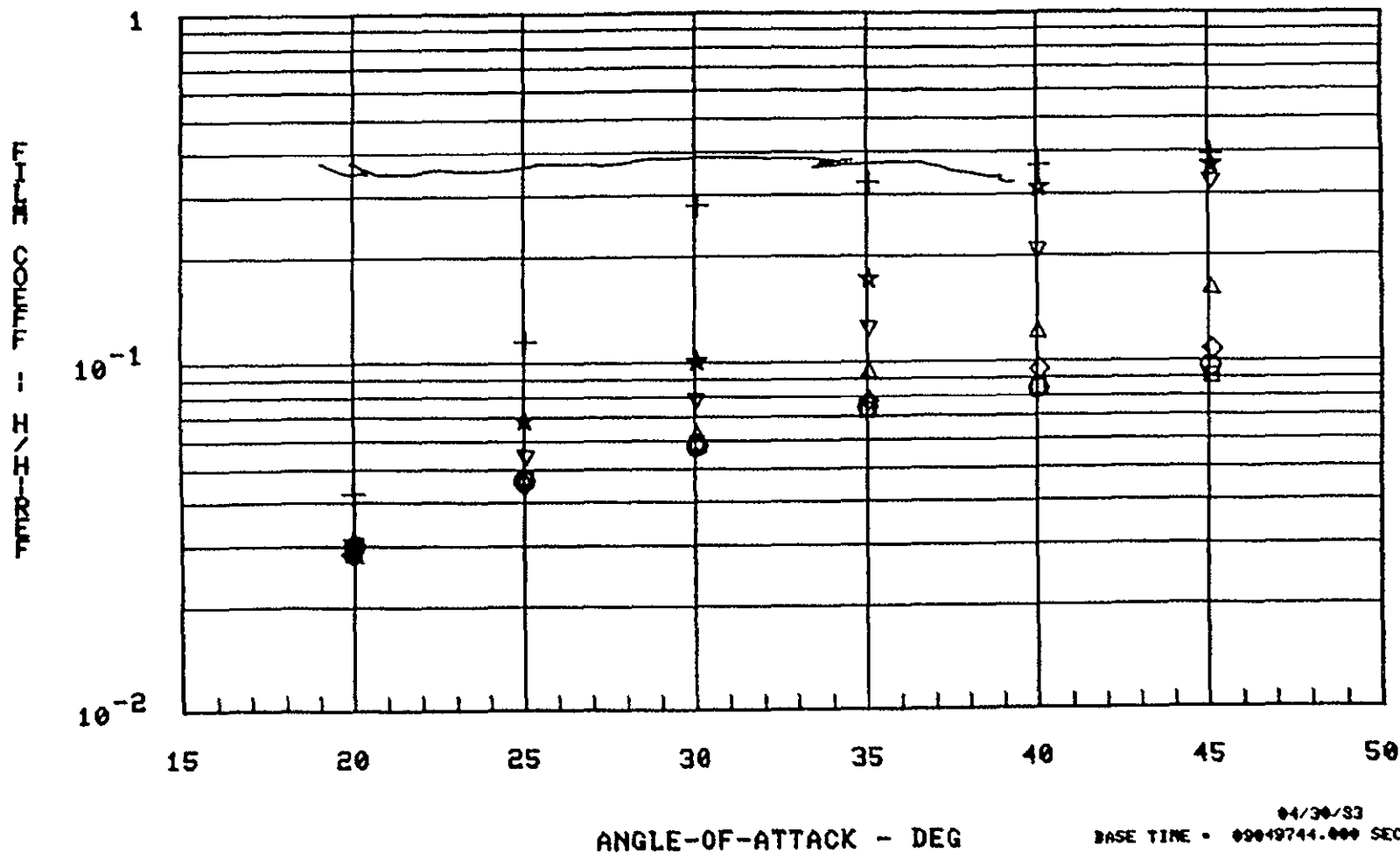
B-275

# STS-1 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9487A/H-REF 1065-1460 SEC



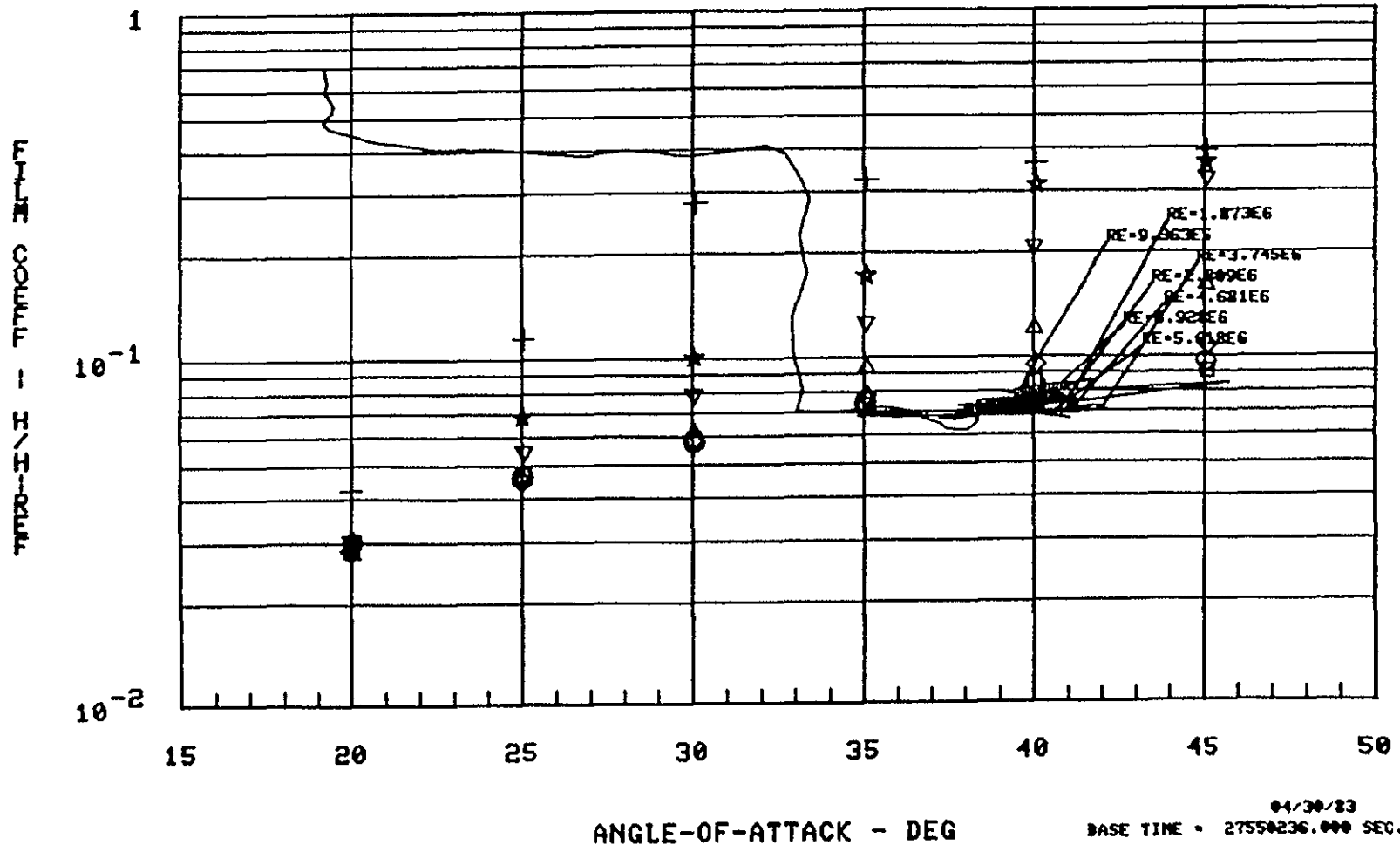
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# STS-2 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9487A/H-REF 200-1480 SEC



B-277

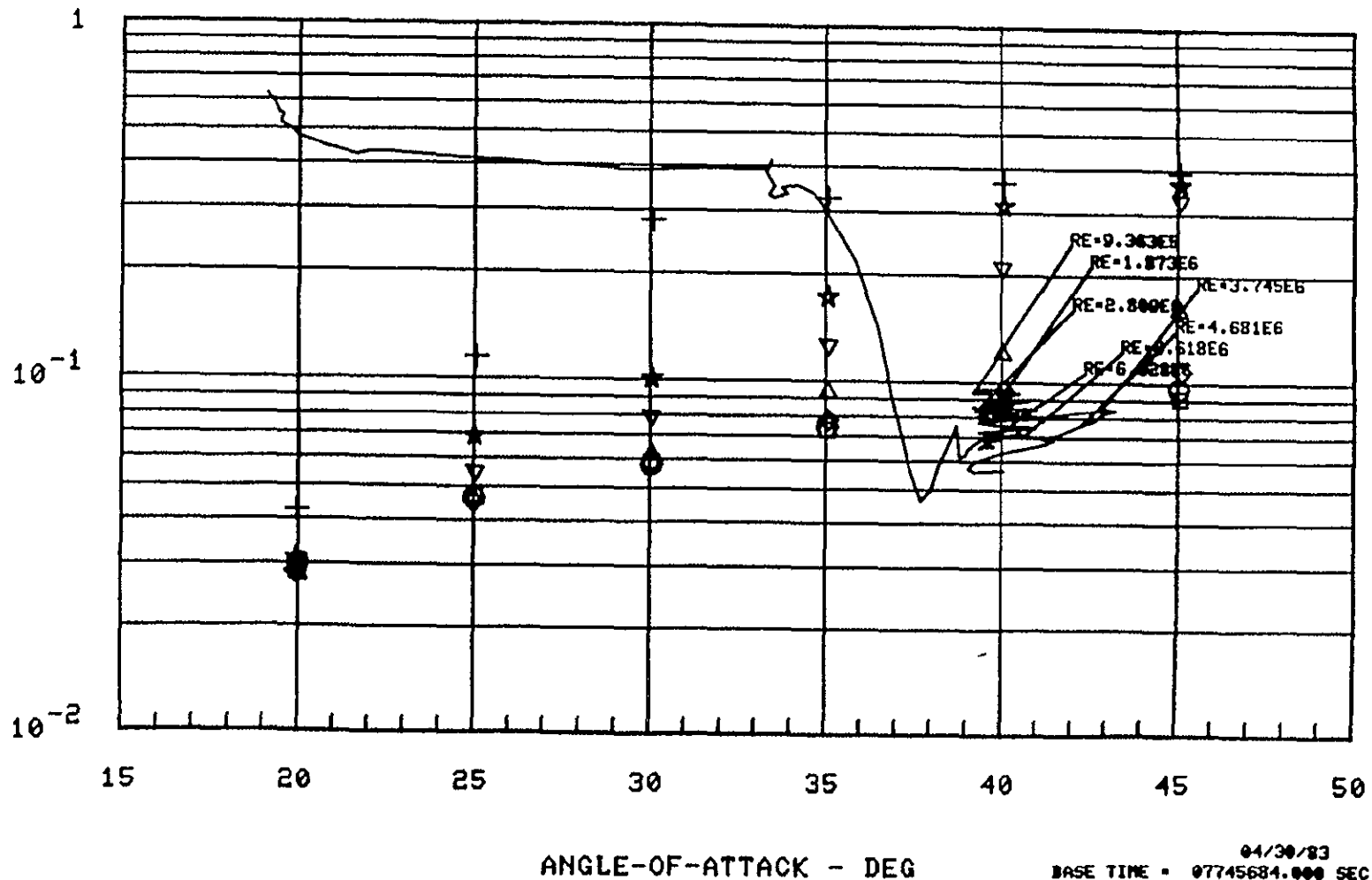
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# STS-3 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9487A/H-REF 200-1380 SEC



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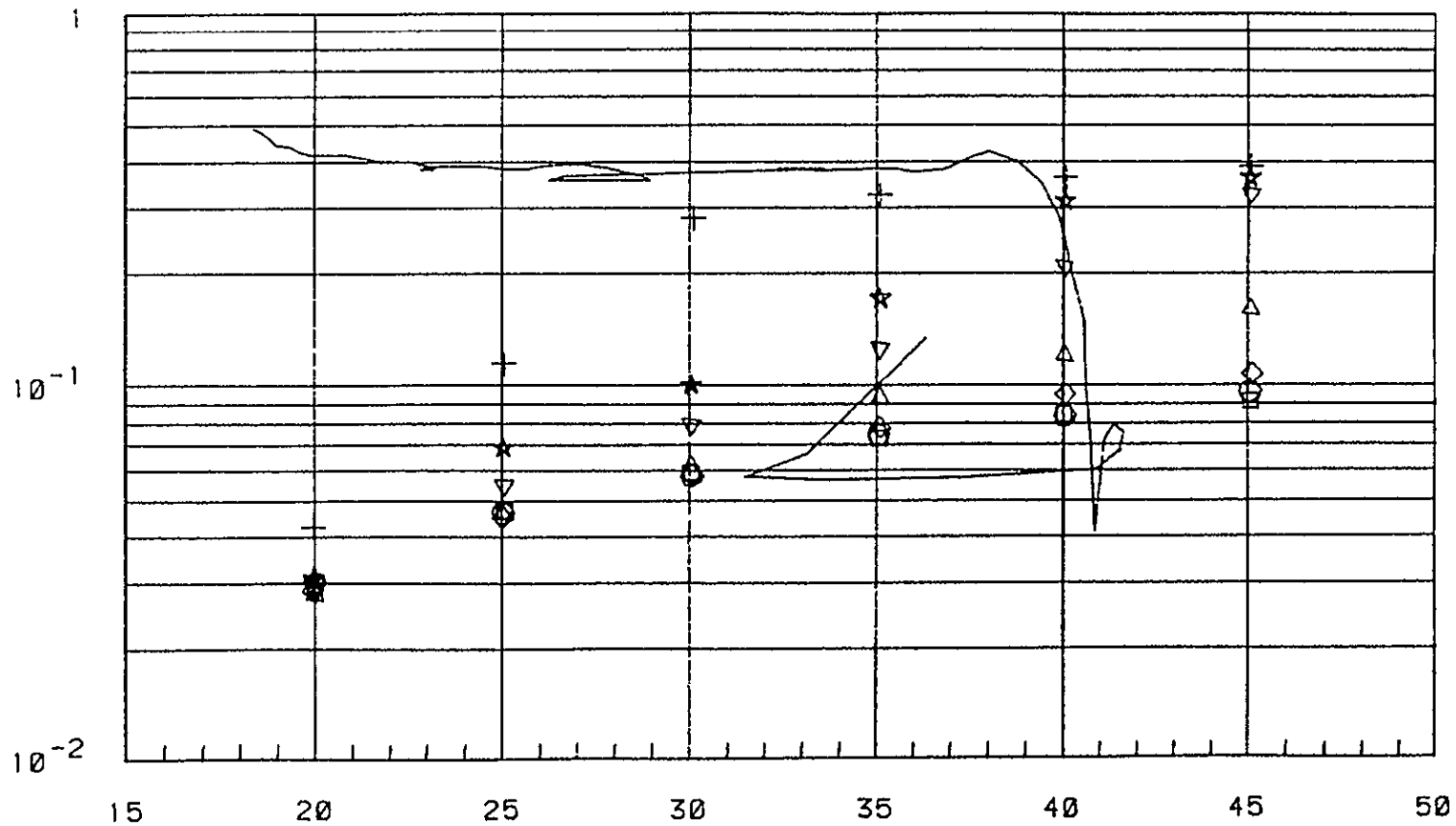
# STS-4 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

———— V07T0487A/H-REF 065-1300 SEC

U-I-E COEFF - I-I-REF



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ANGLE-OF-ATTACK - DEG

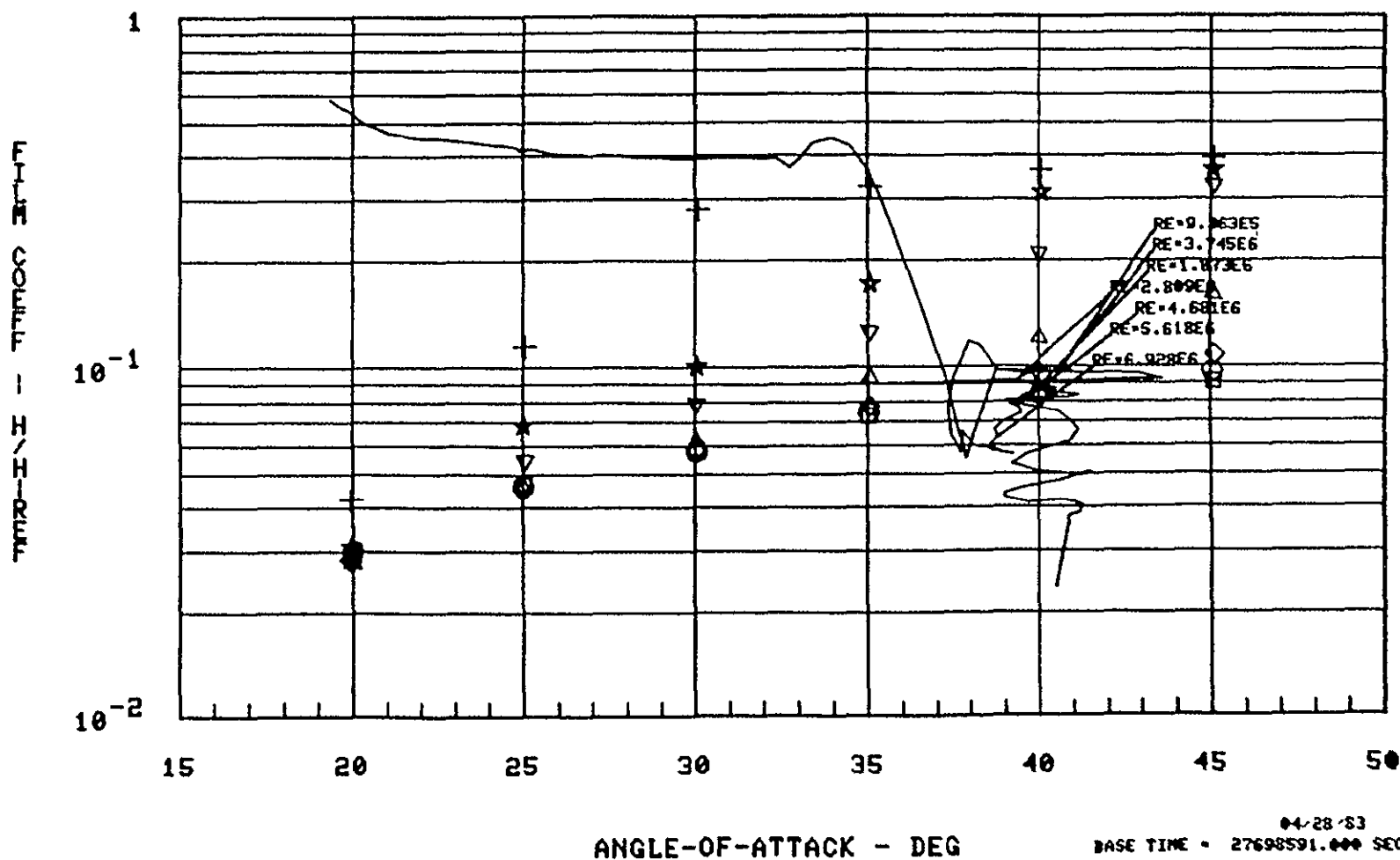
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# STS-5 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
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U07T9487A/H-REF 150-1350 SEC

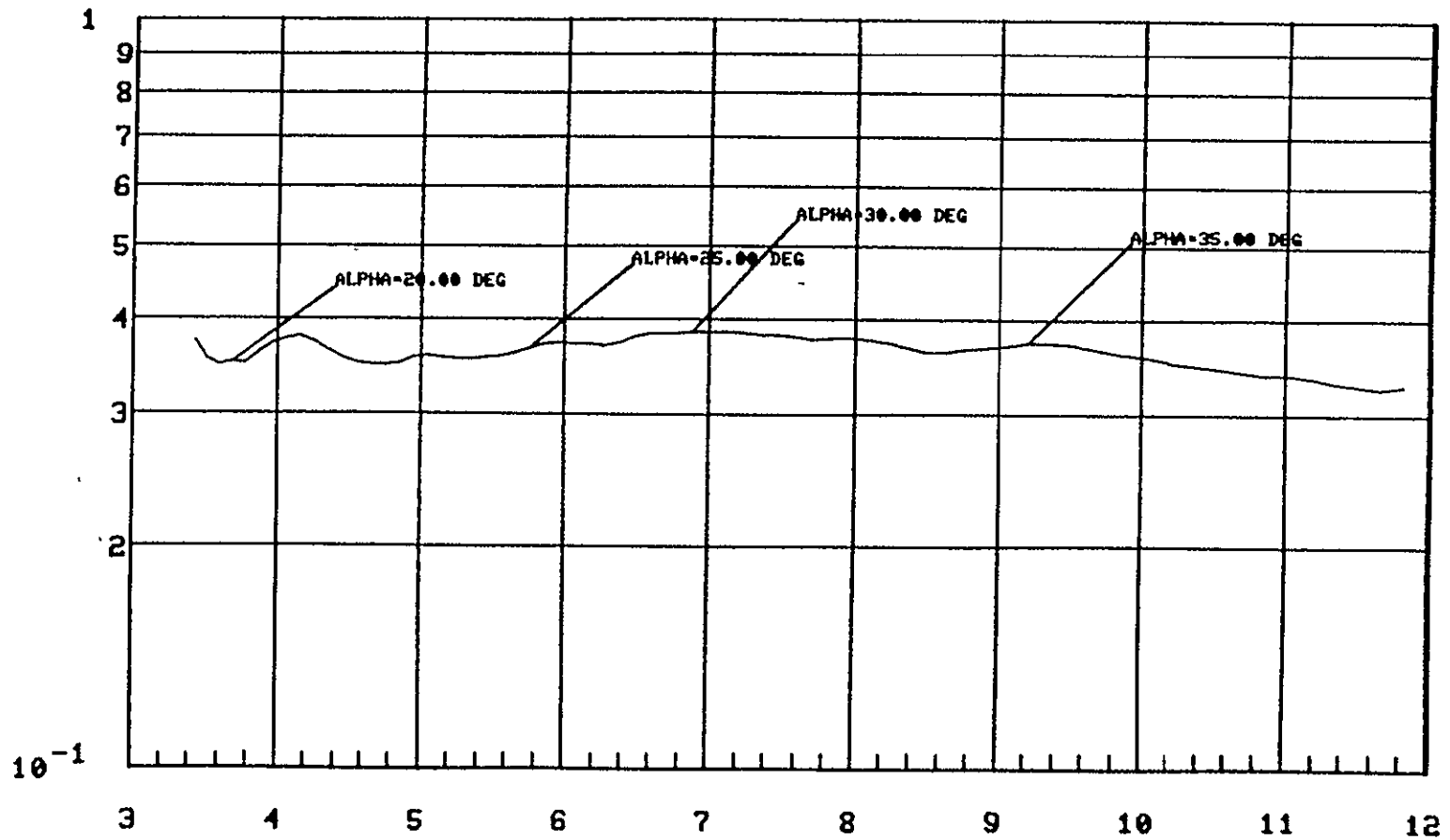




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U07T9487A/H-REF 1065-1460 SEC

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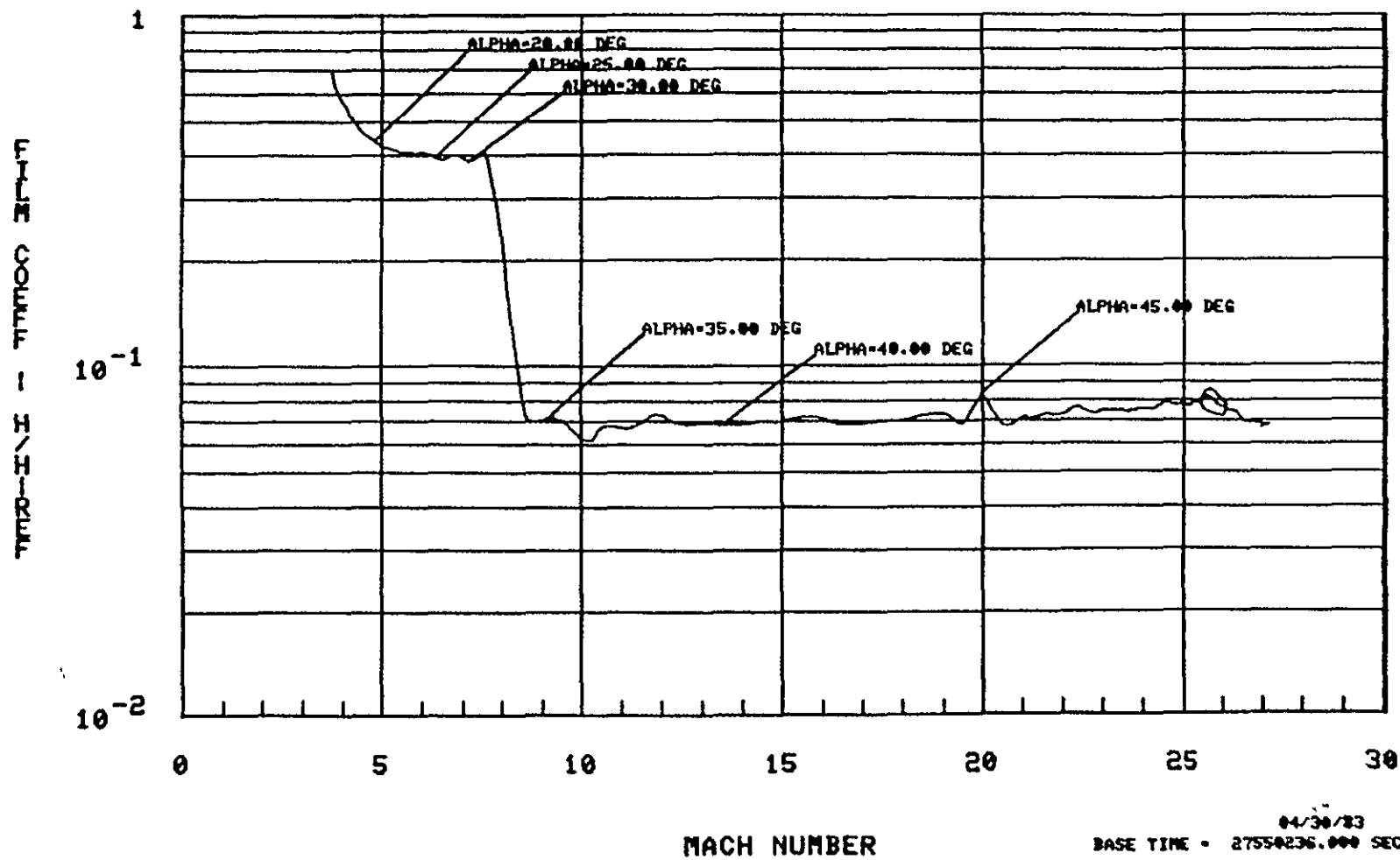
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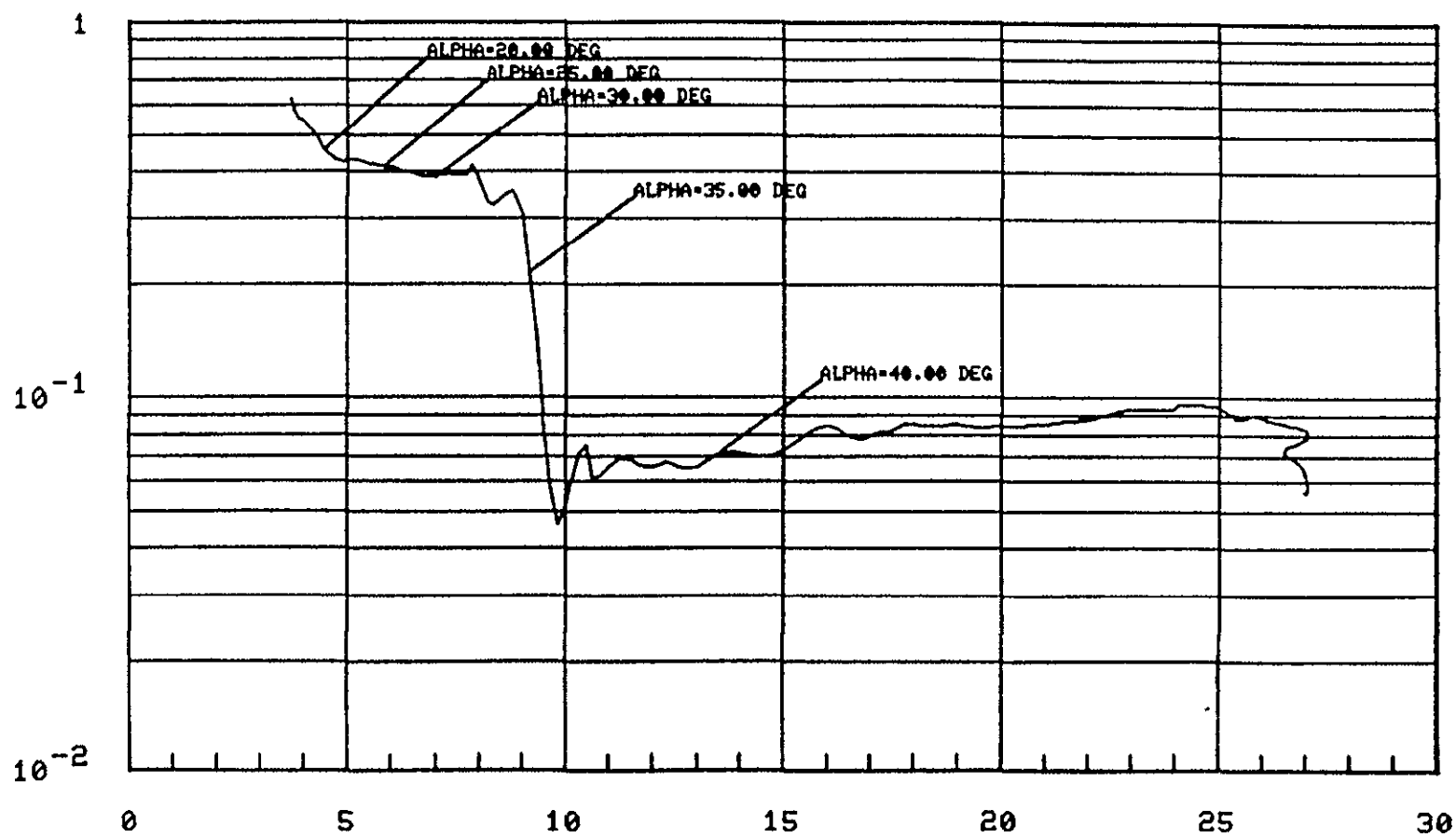
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U07T9487A/H-REF 200-1380 SEC



LINE QUALITY - I/I-QUAL

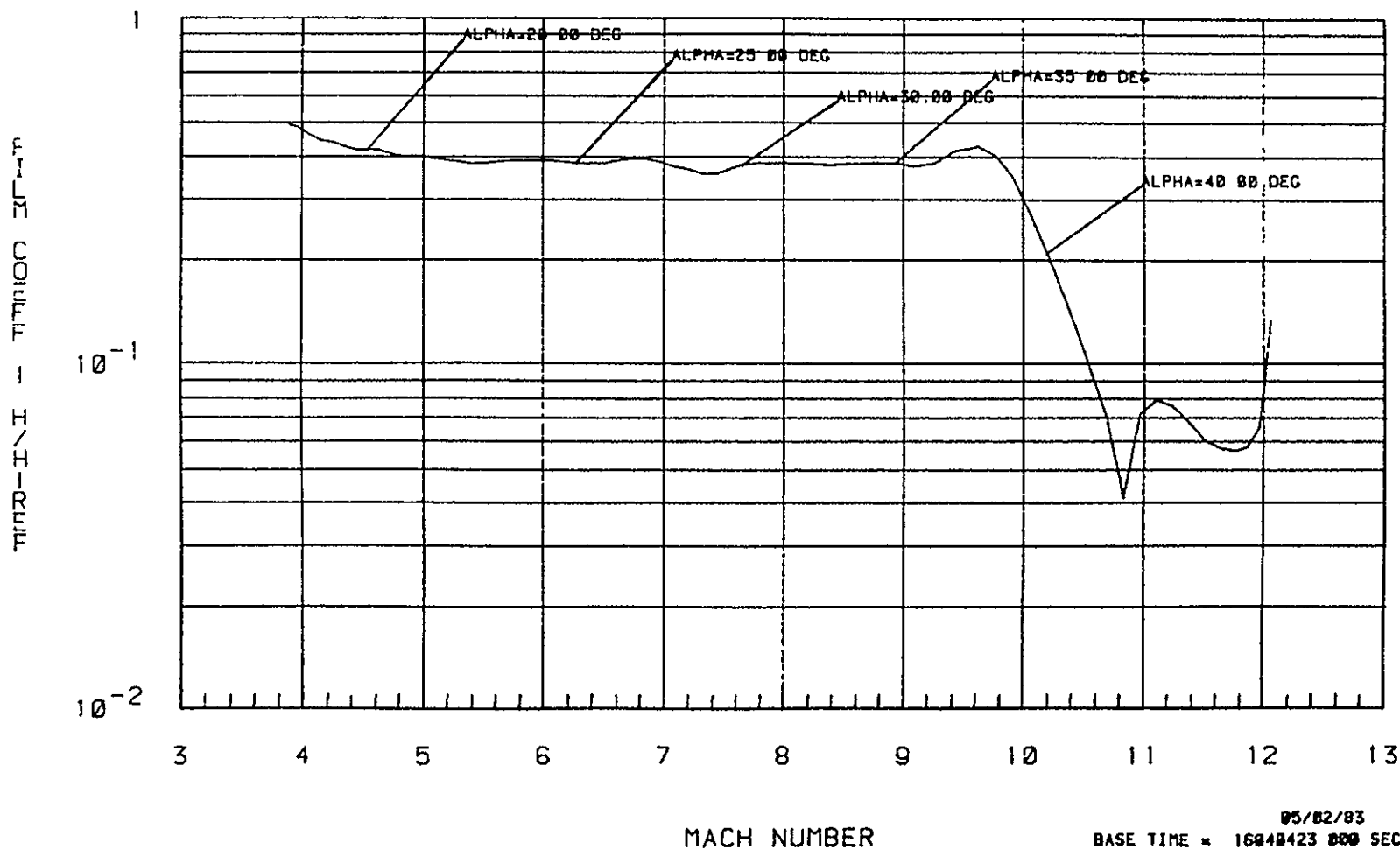
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———— V07T0487A/H-REF 065-1300 SEC

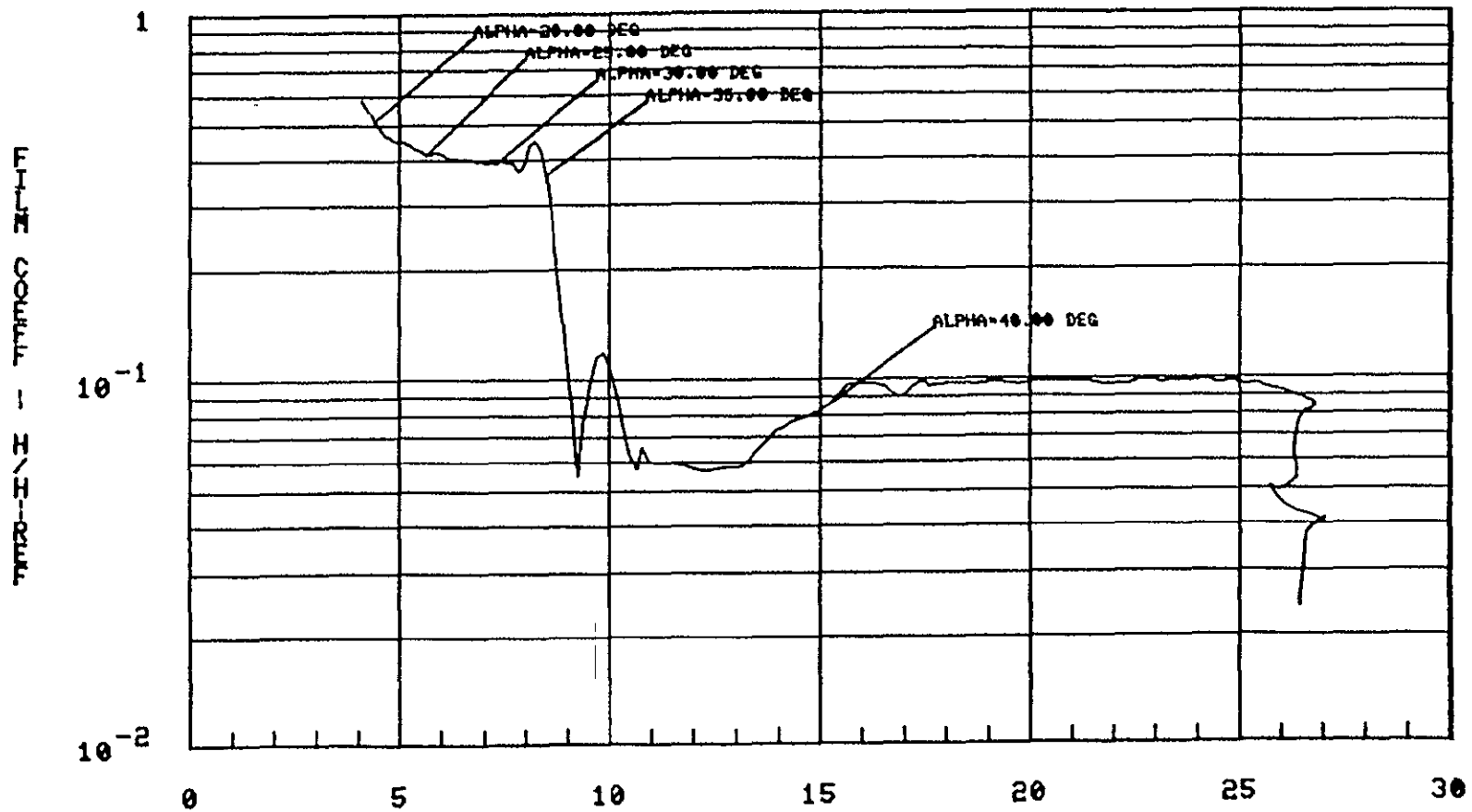


B-284

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# STS-5 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

U07T9487A/H-REF 150-1350 SEC



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B-285

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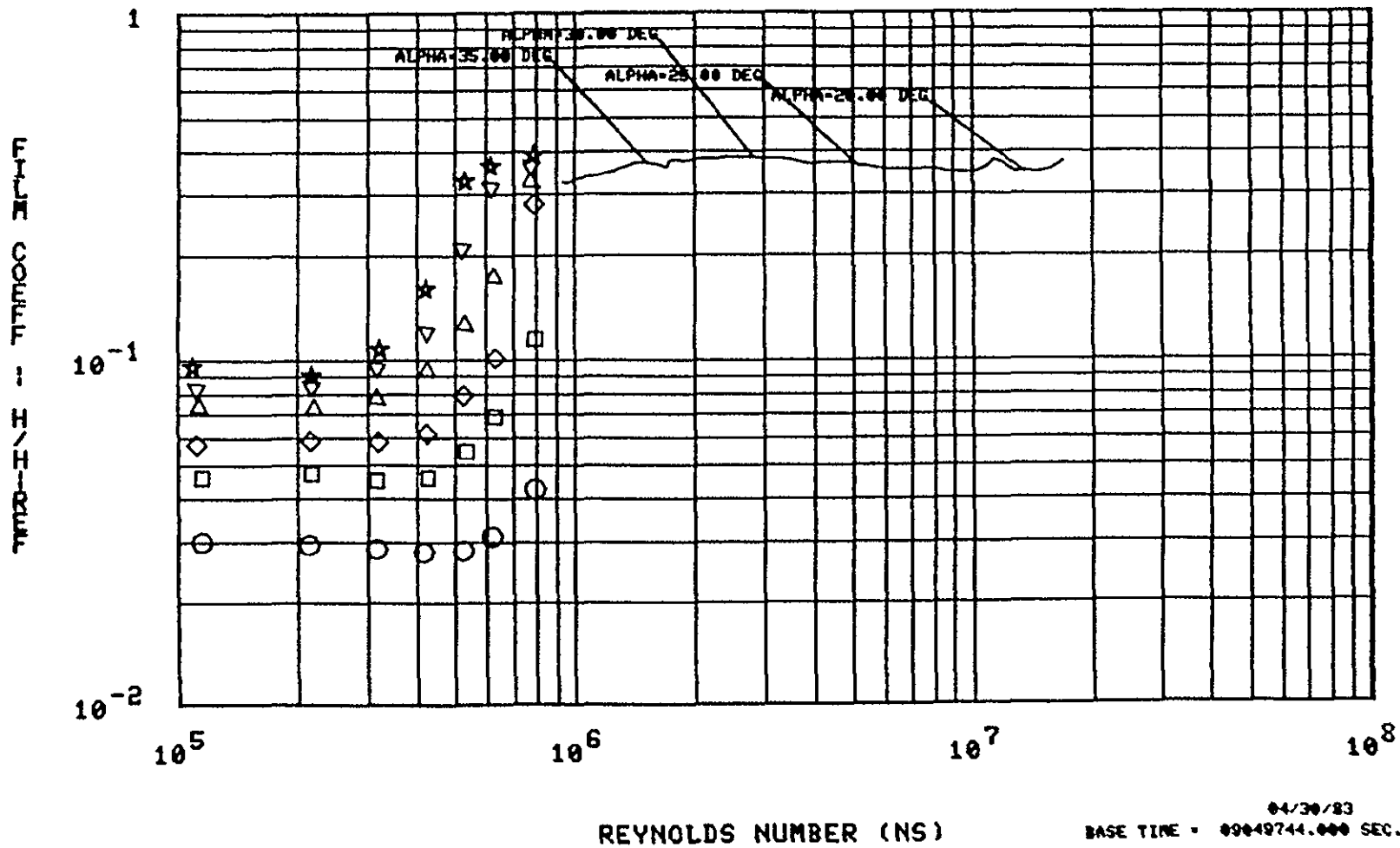
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# STS-1 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9487A/H-REF 1065-1460 SEC



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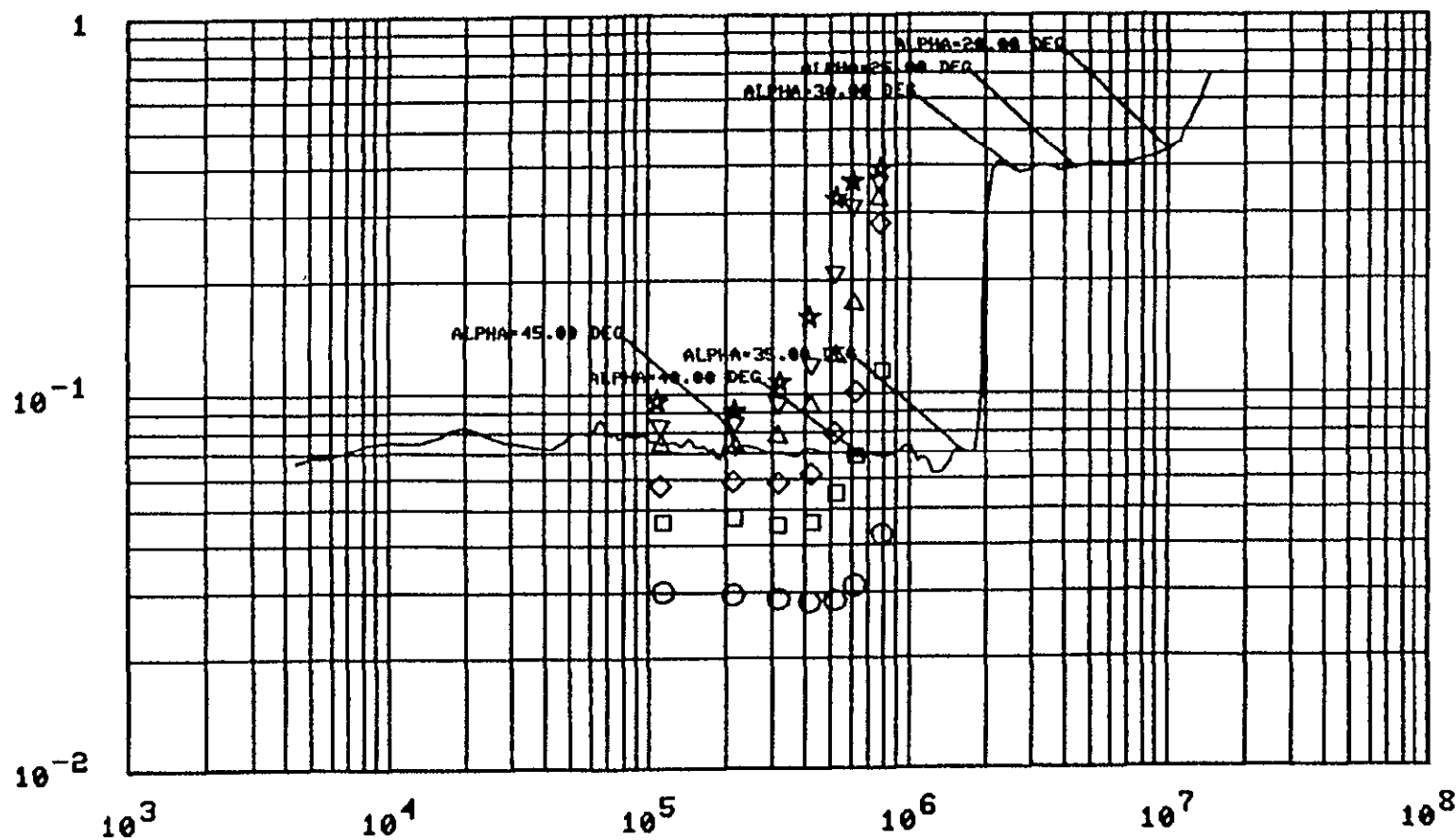
# STS-2 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9487A/H-REF 200-1480 SEC

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B-287

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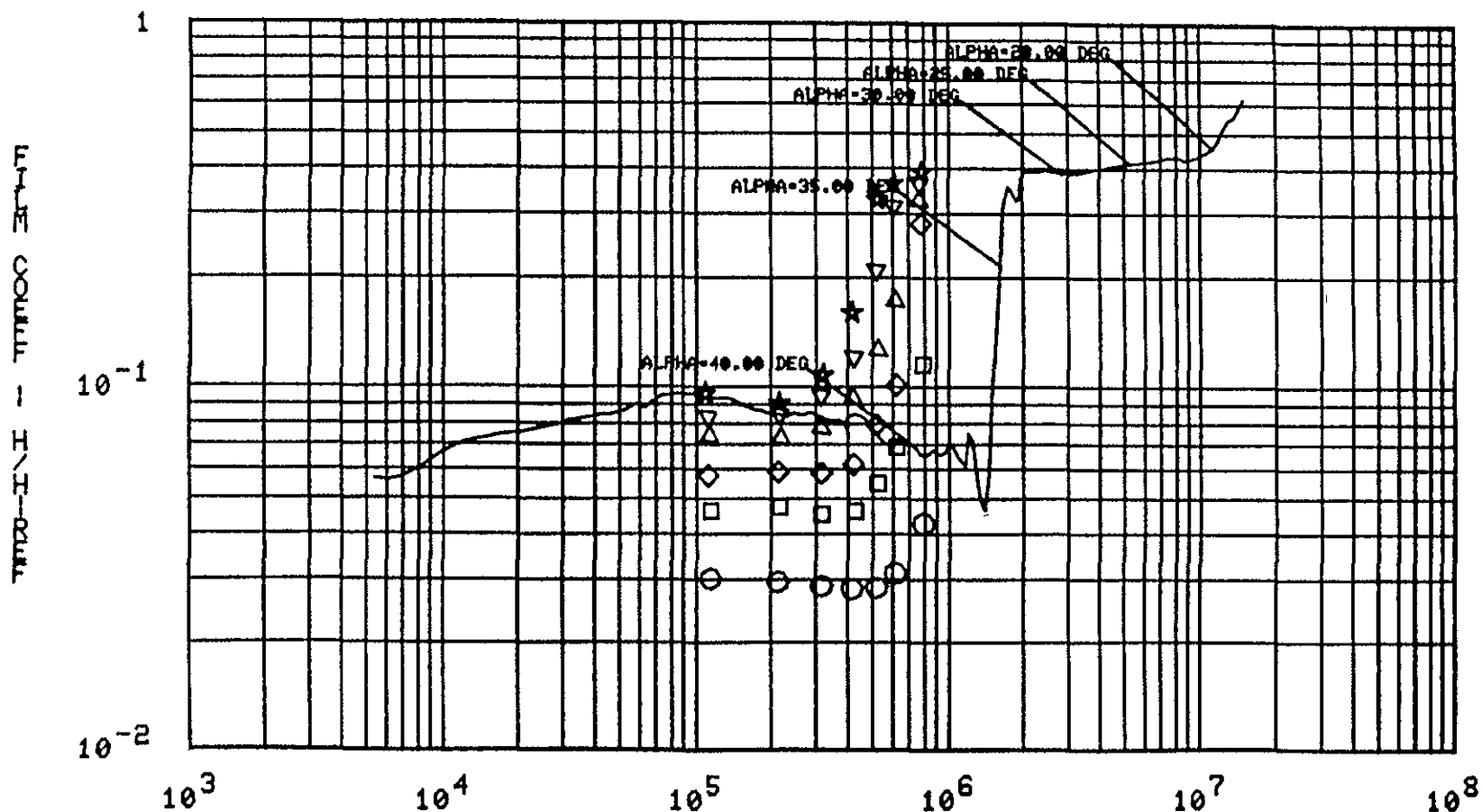
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# STS-3 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U07T9487A/H-REF 200-1380 SEC



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B-288

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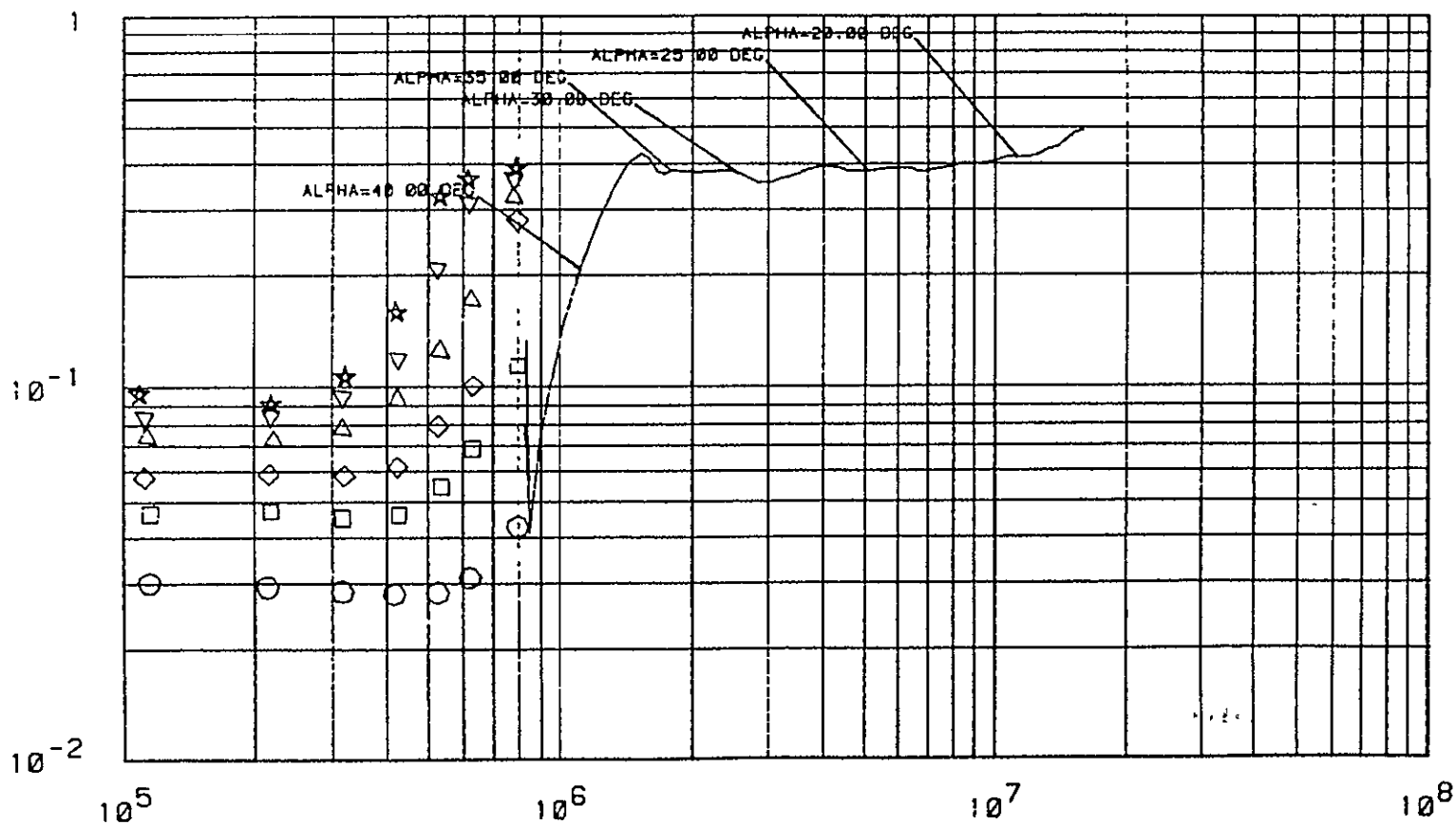
# STS-4 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

V07T0487A/H-REF 965-1300 SEC

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B-289

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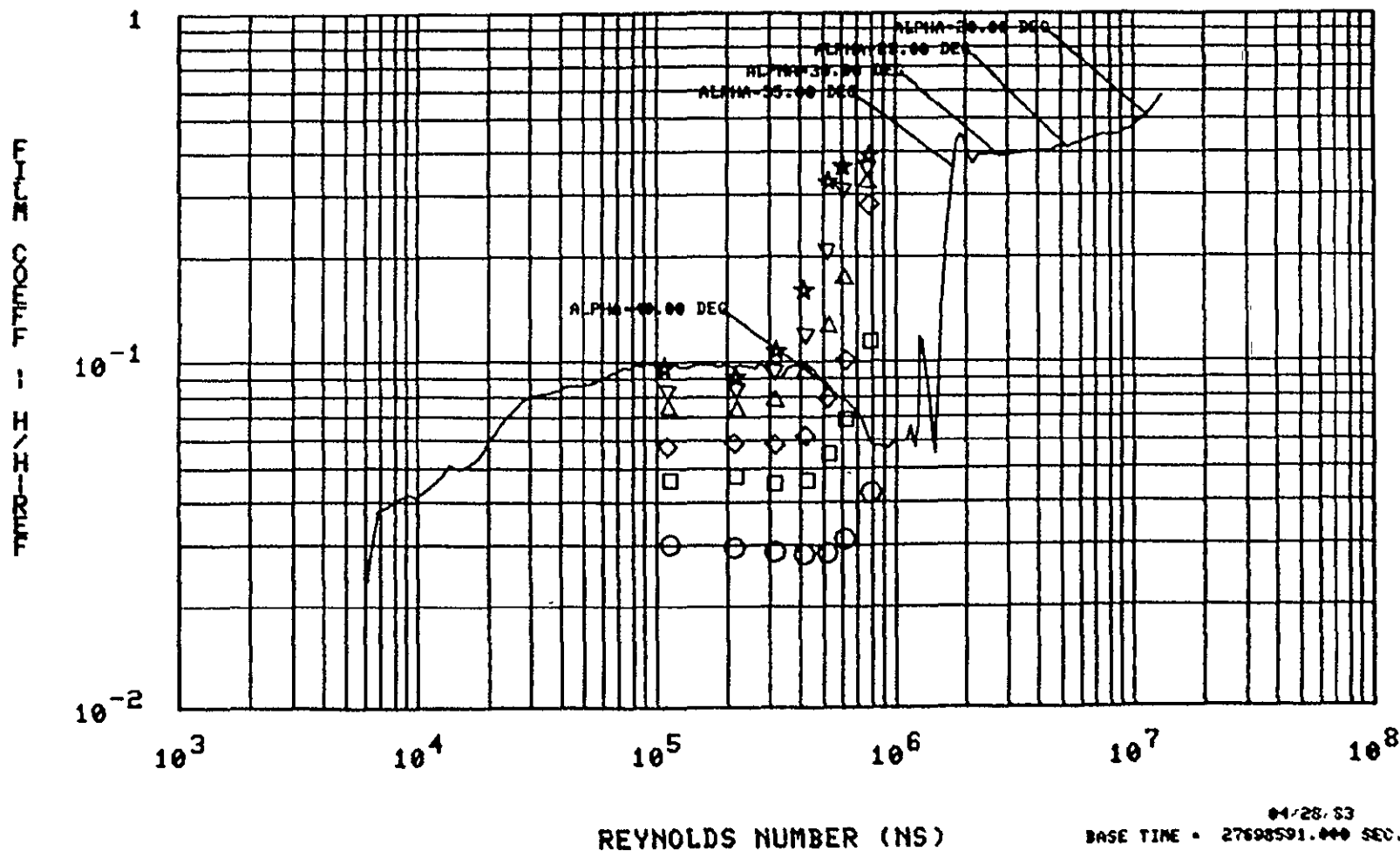
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# STS-5 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
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OH49 ALPHA = 45 DEGREES

U07T9487A/H-REF 150-1350 SEC

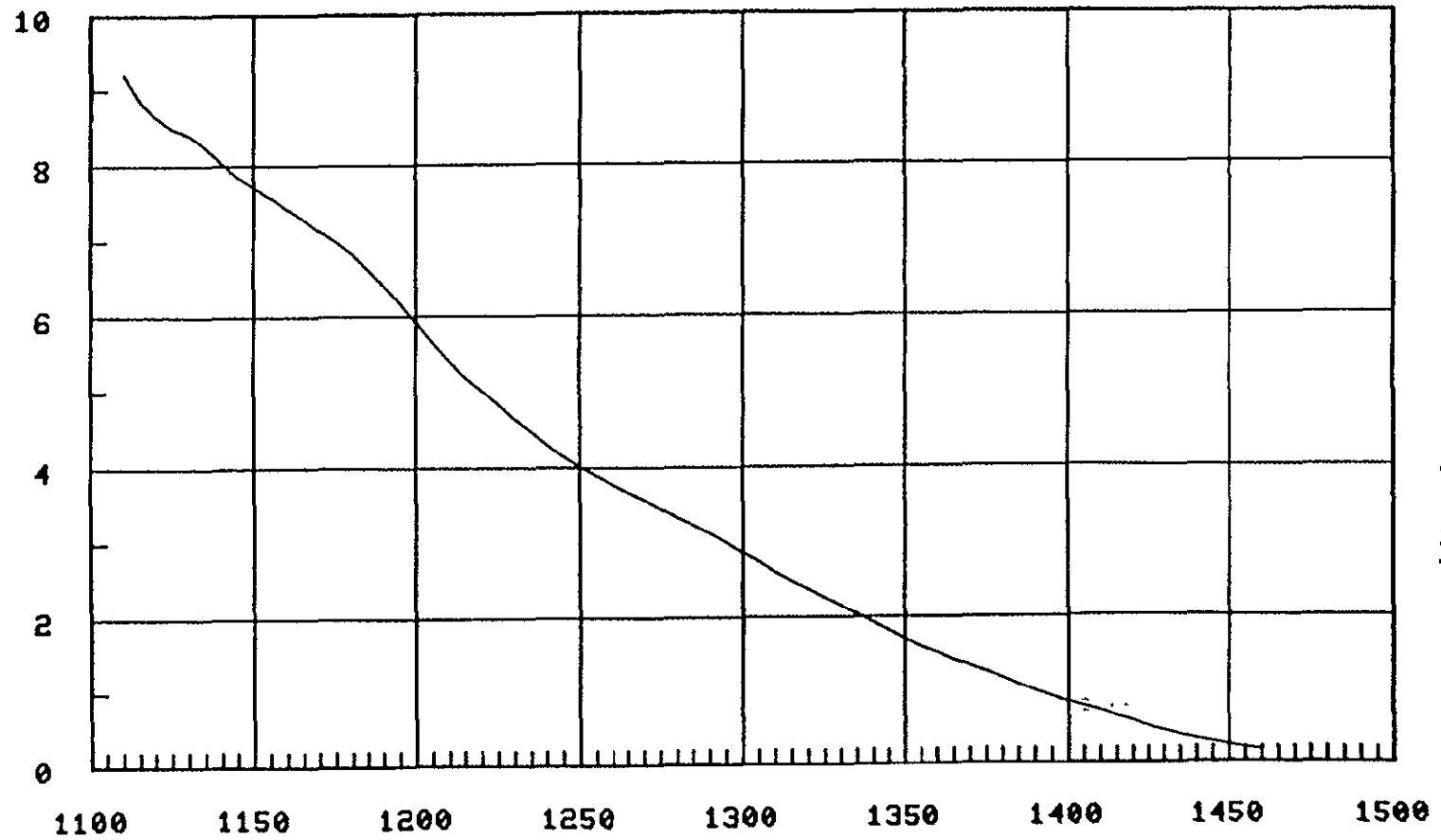


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# STS-1 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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INDICATED RATE - RATIO - SMO



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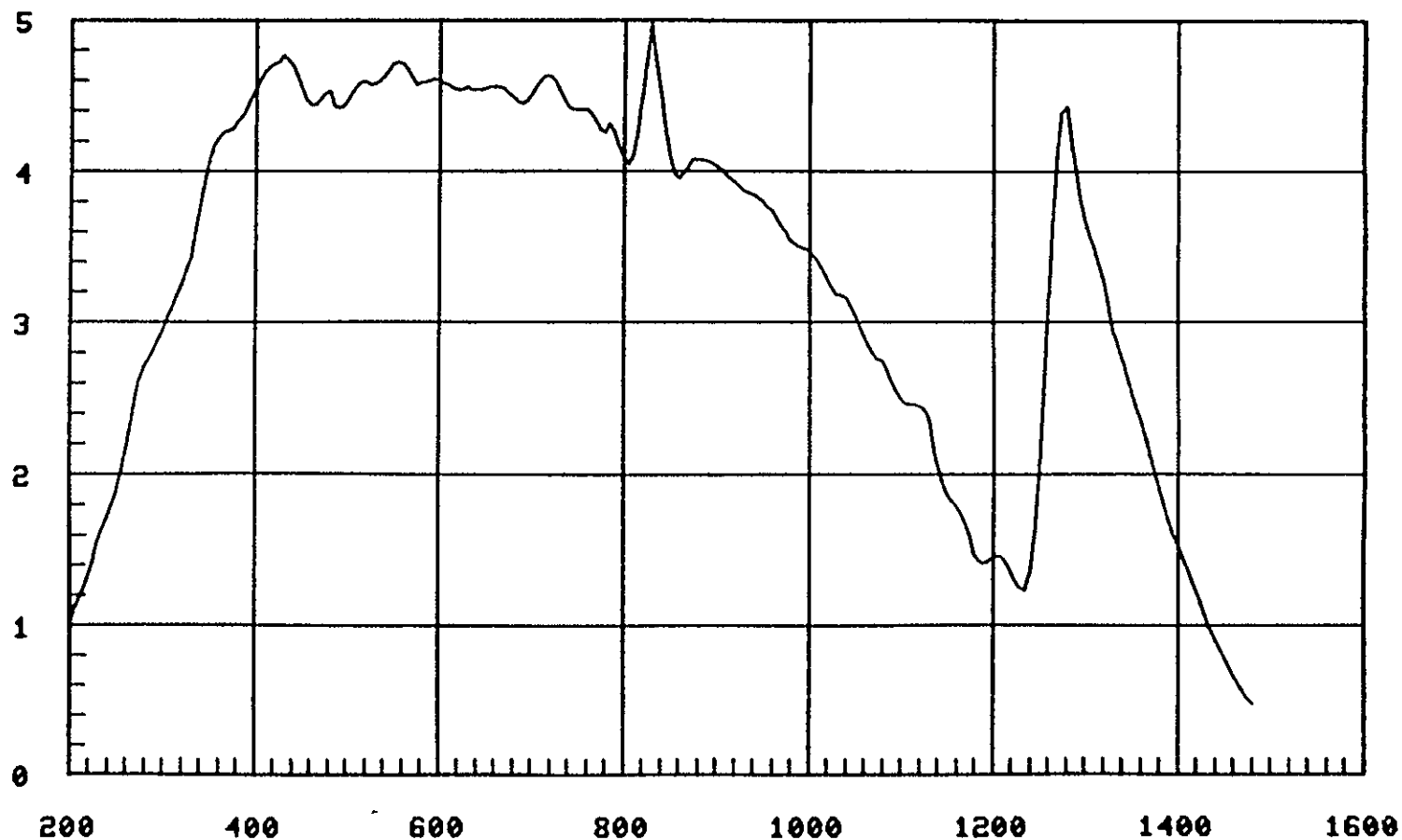
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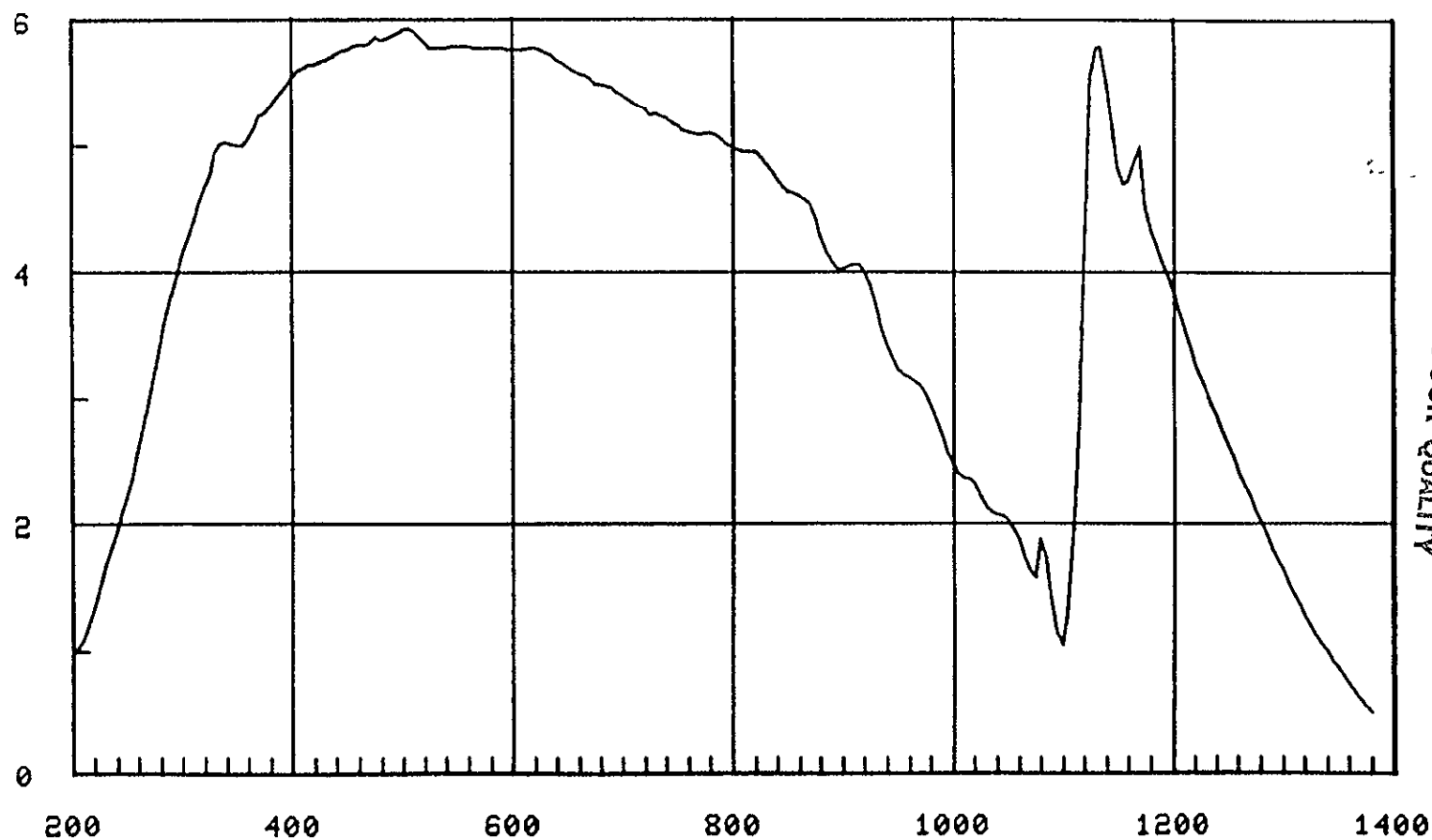
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U07T9487A

INTEGRATED ACCELERATION - G



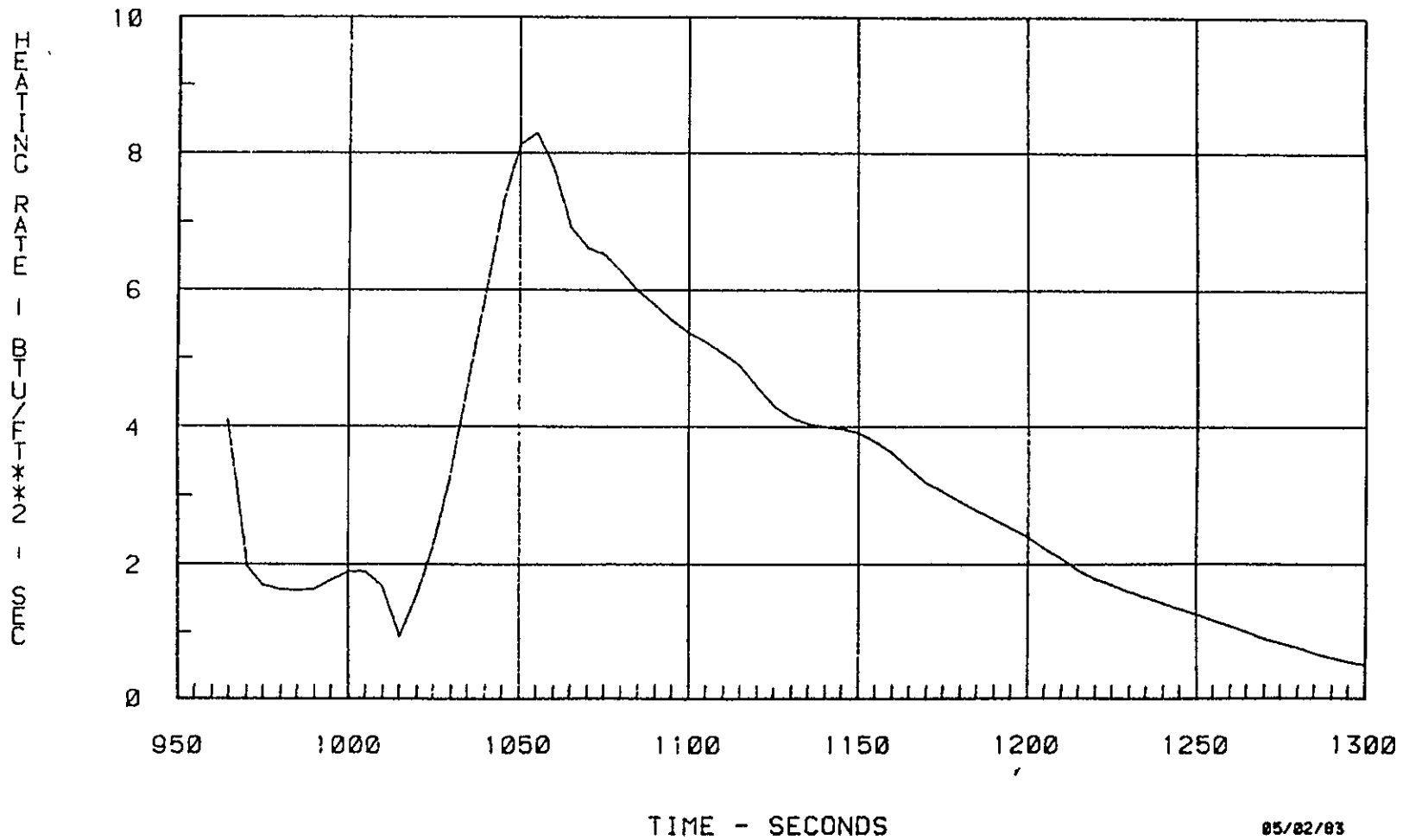
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TIME - SECONDS

04/30/83

STS-4 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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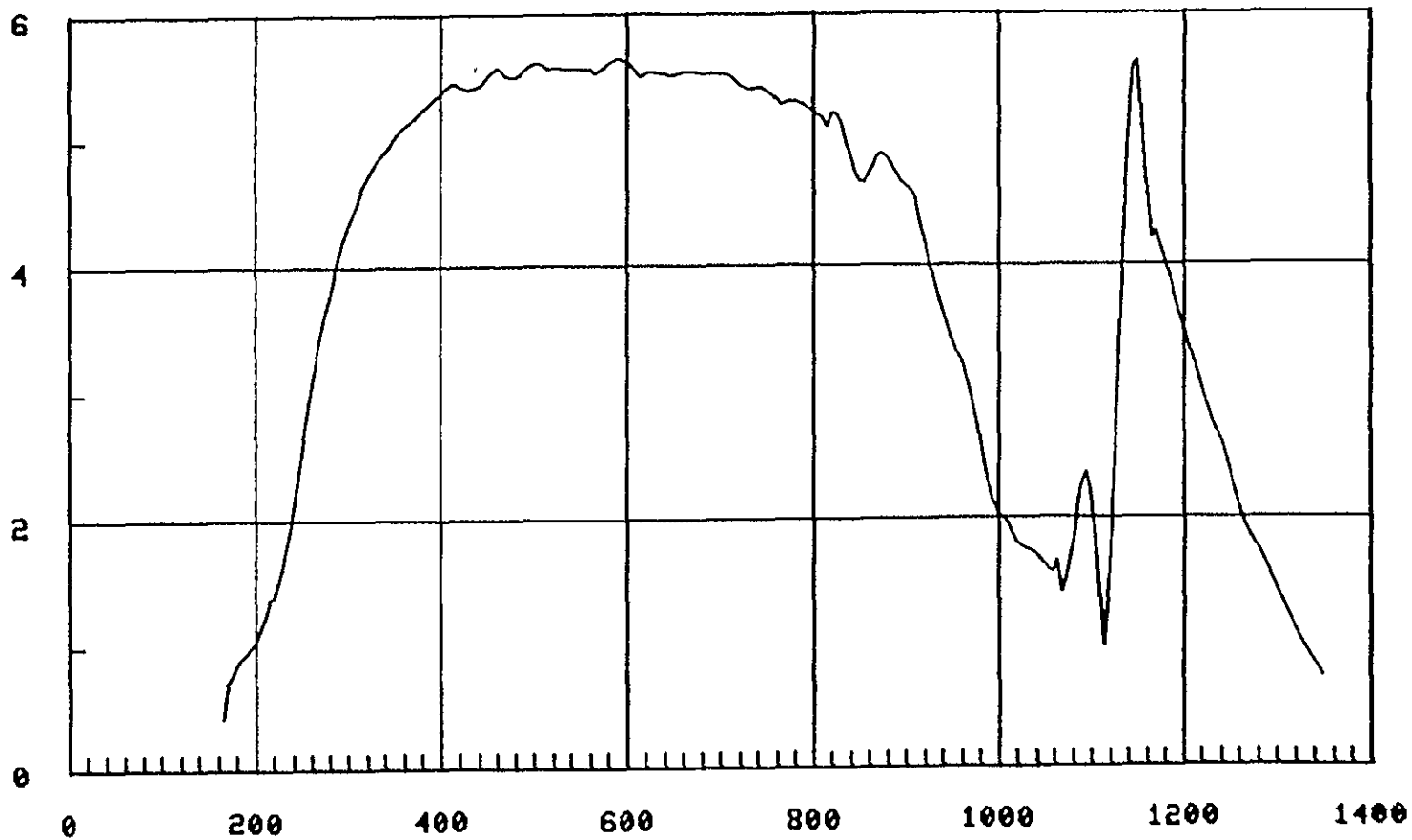


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# STS-5 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

U07T9487A

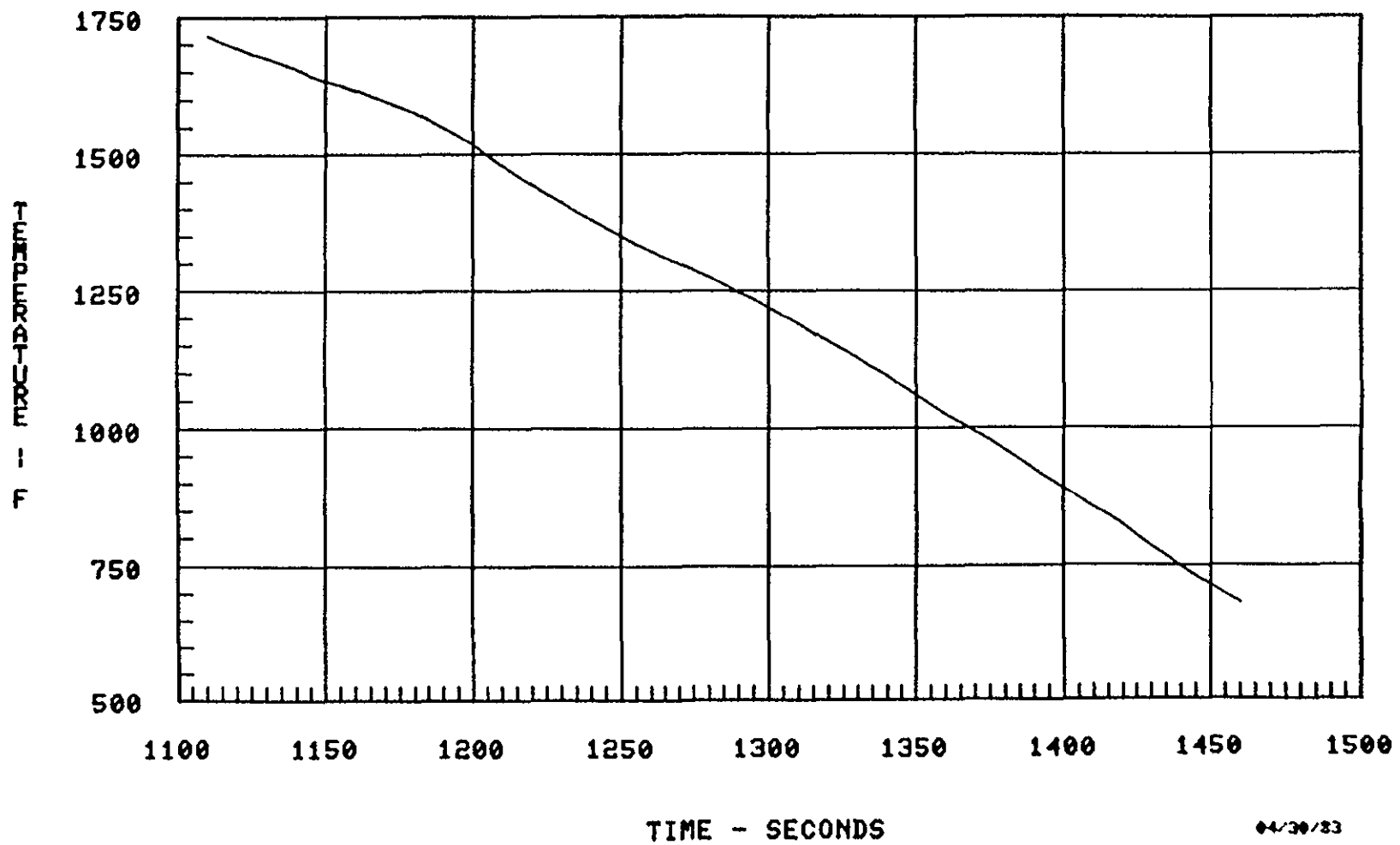
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# STS-1 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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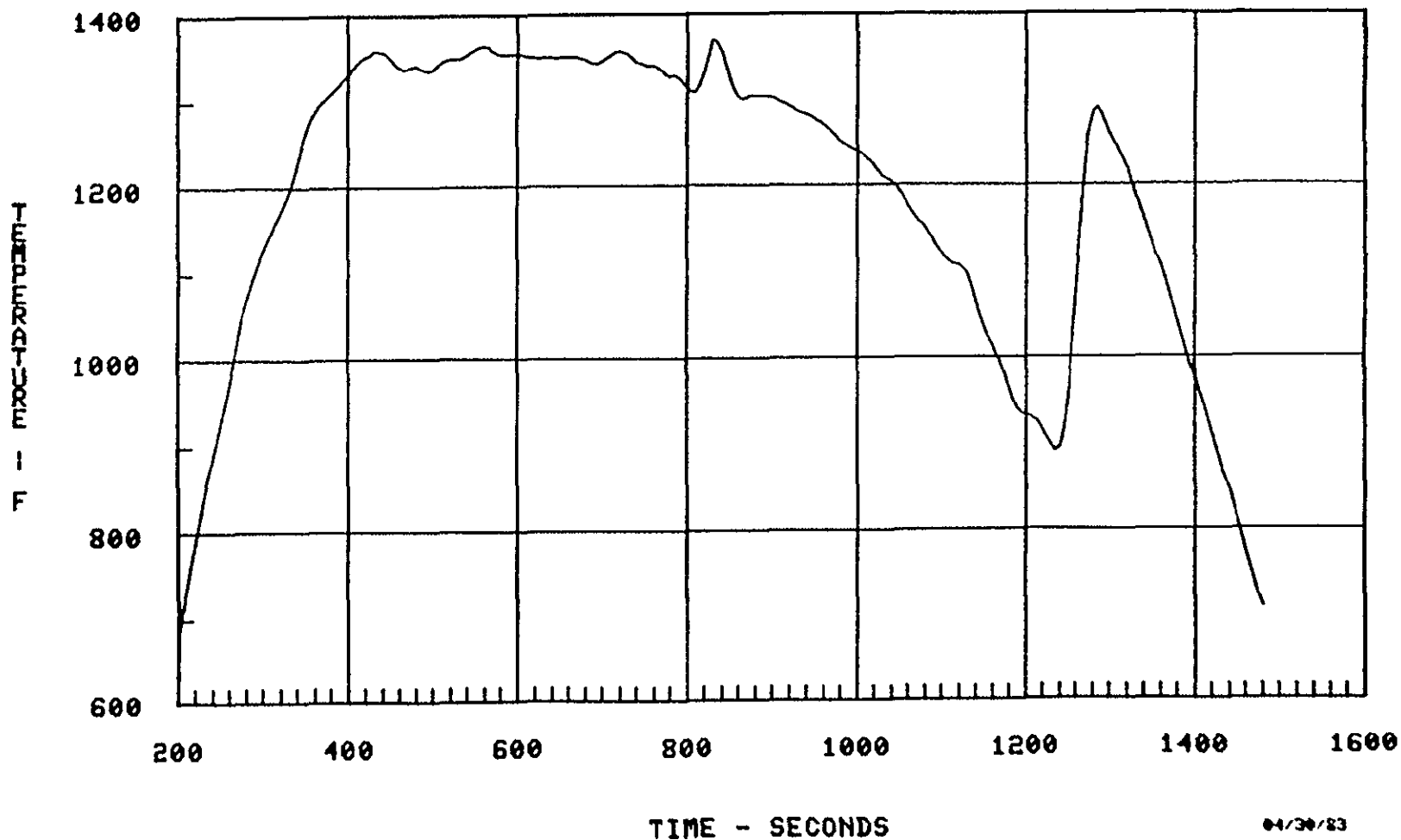


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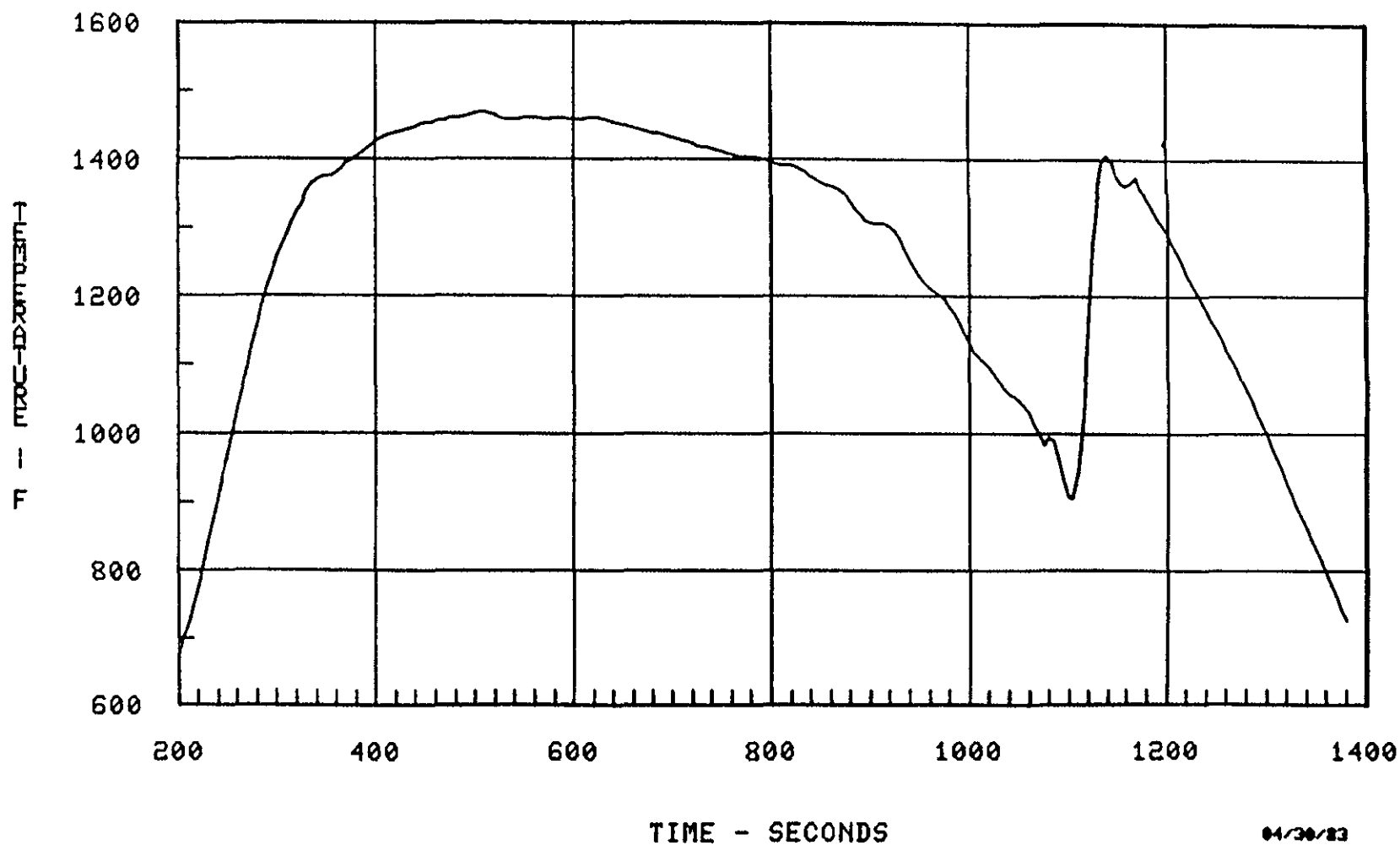
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# STS-3 (107 FT LENGTH CL $X/L=0.80$ ) FLIGHT PARAMETER COMPARISO

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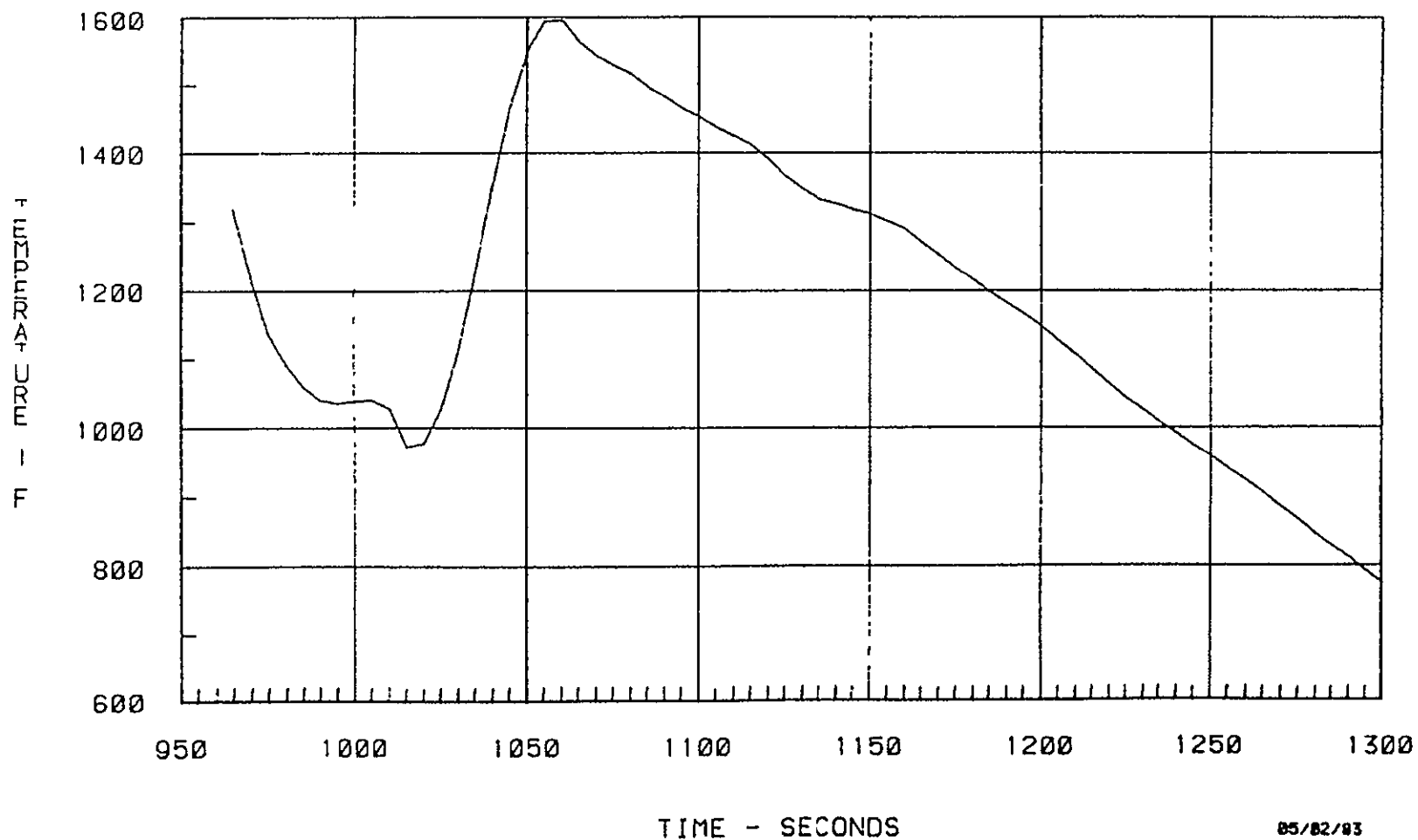
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B-298

04/30/83

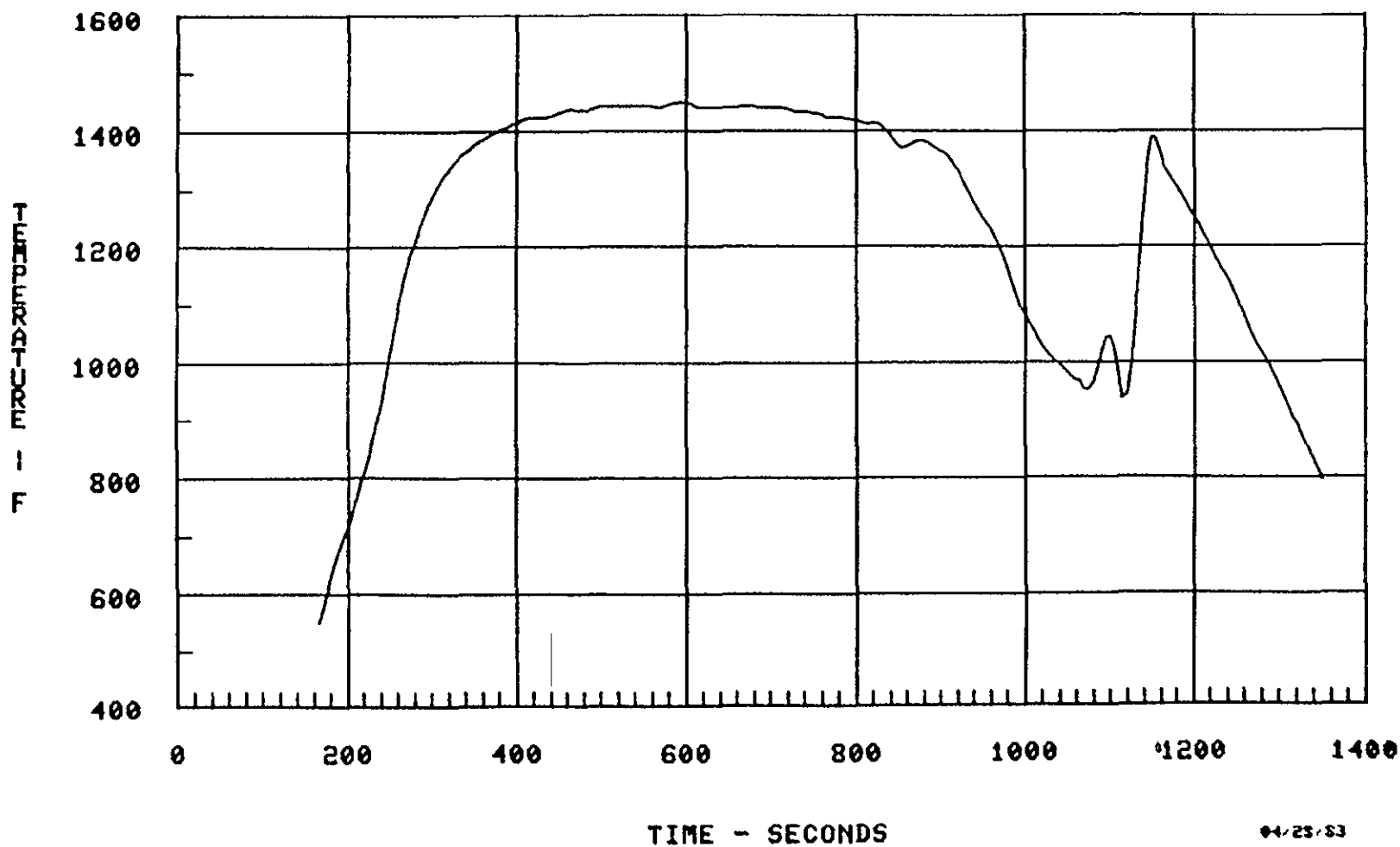
# STS-4 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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# STS-5 (107 FT LENGTH CL X/L=0.80) FLIGHT PARAMETER COMPARISO

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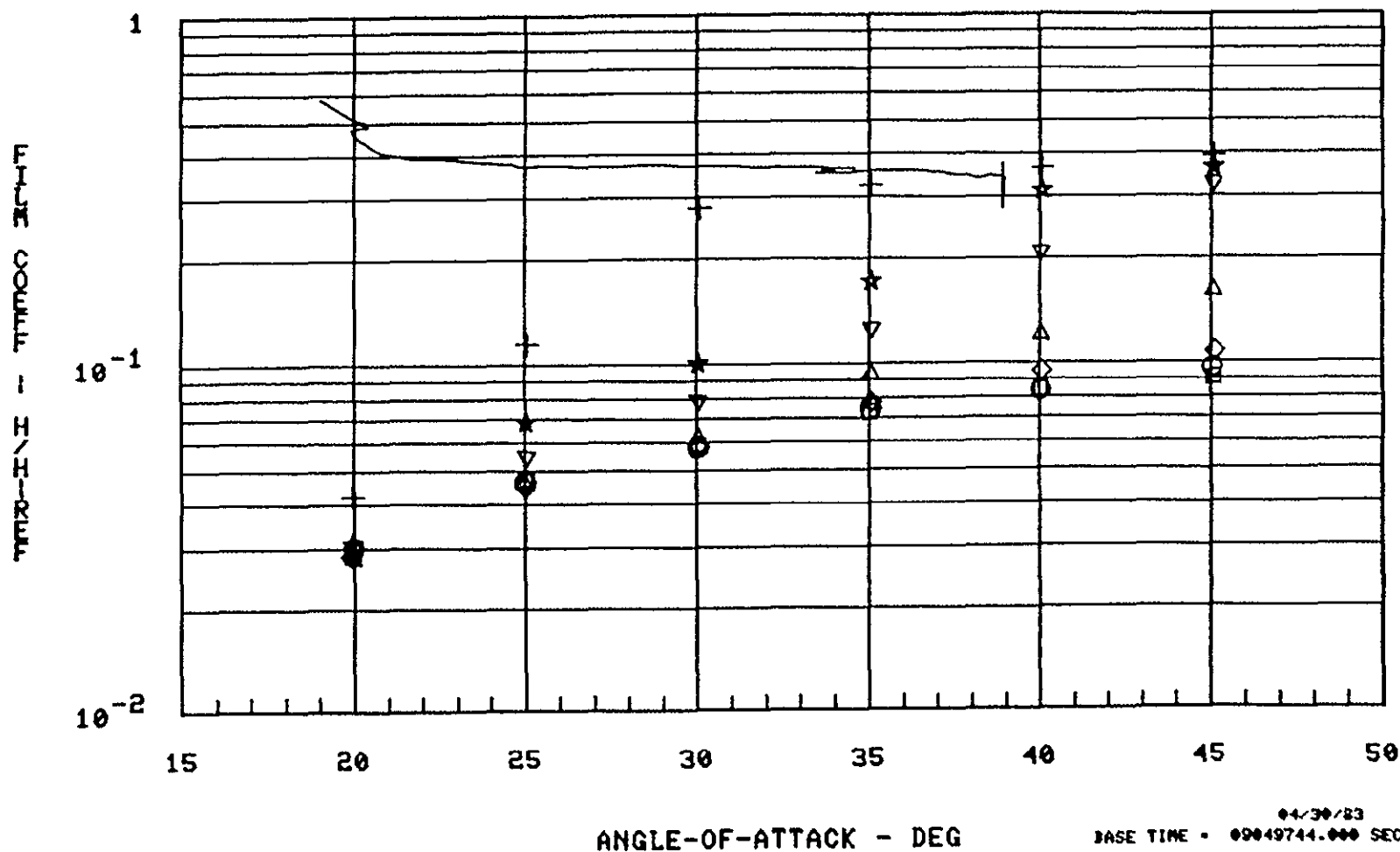
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# STS-1 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9761A/H-REF 1065-1460 SEC



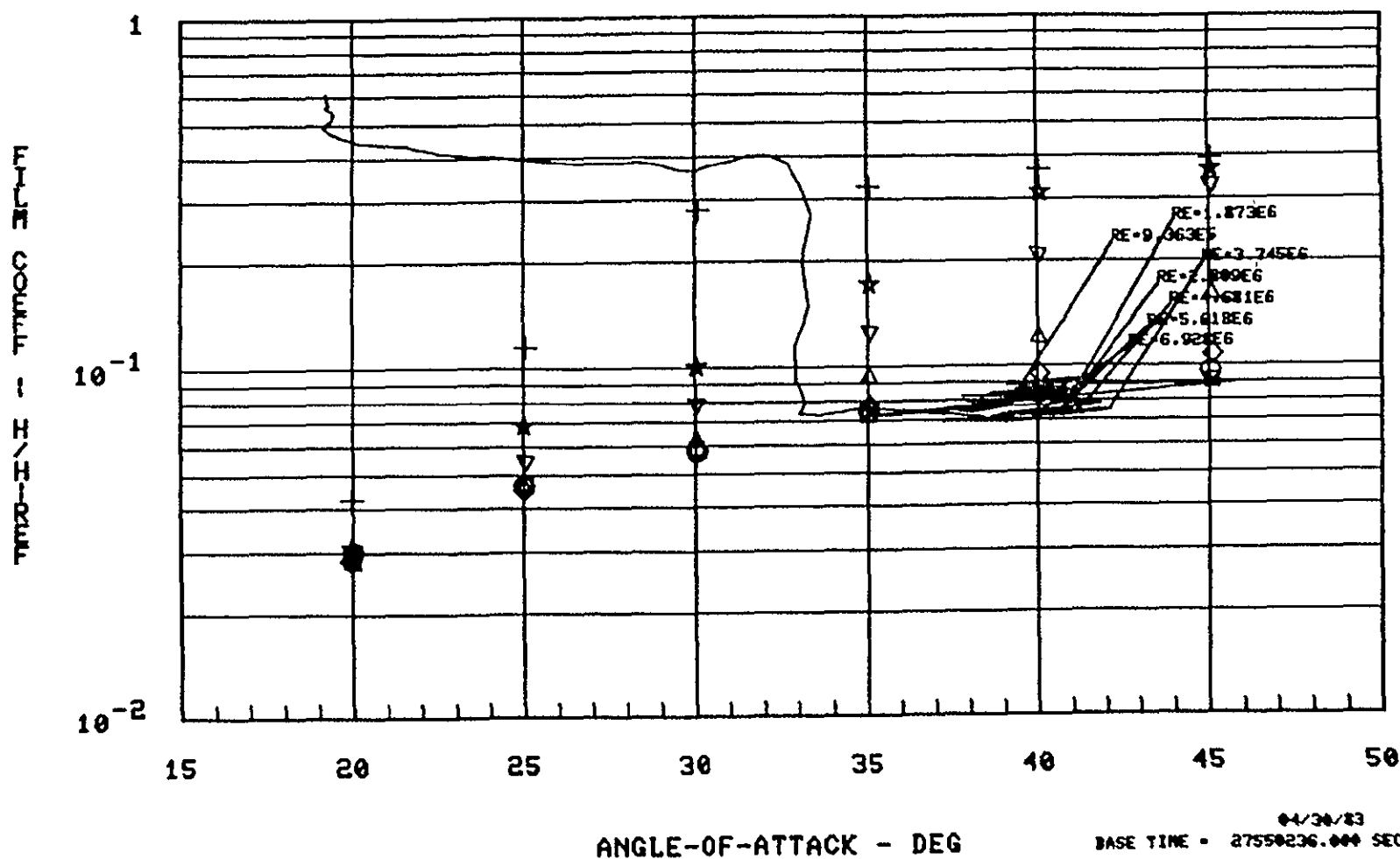
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OH49 0.0175 SCALE RE = 0.5 E06
OH49 0.0175 SCALE RE = 1.0 E06
OH49 0.0175 SCALE RE = 1.5 E06
OH49 0.0175 SCALE RE = 2.0 E06
OH49 0.0175 SCALE RE = 2.5 E06
OH49 0.0175 SCALE RE = 3.0 E06
OH49 0.0175 SCALE RE = 3.7 E06

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U09T9751A/H-REF 200-1480 SEC



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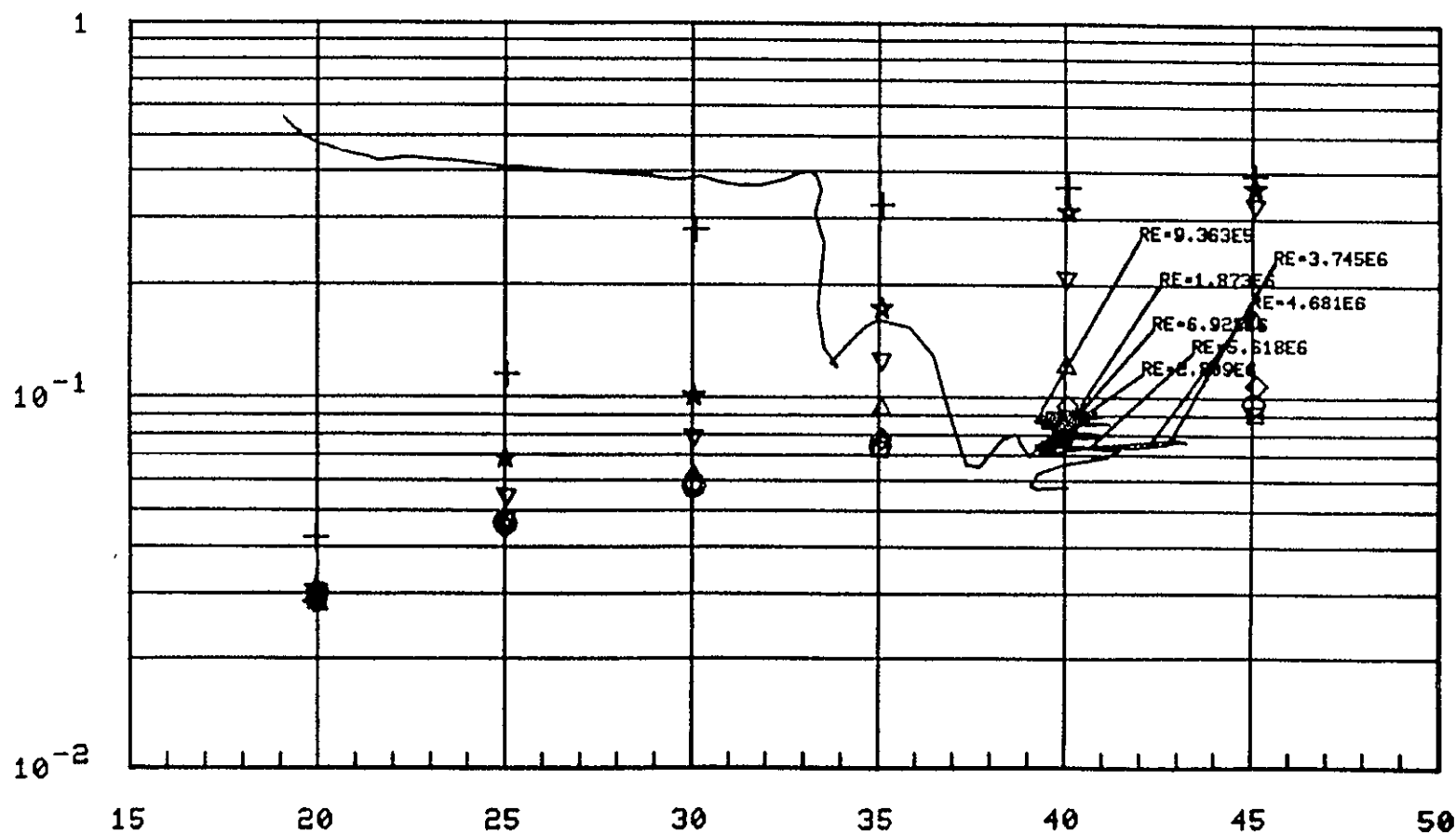
B-302

# STS-3 (107 FT LENGTH CL $X/L=0.81$ ) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9761A/H-REF 200-1380 SEC



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B-303

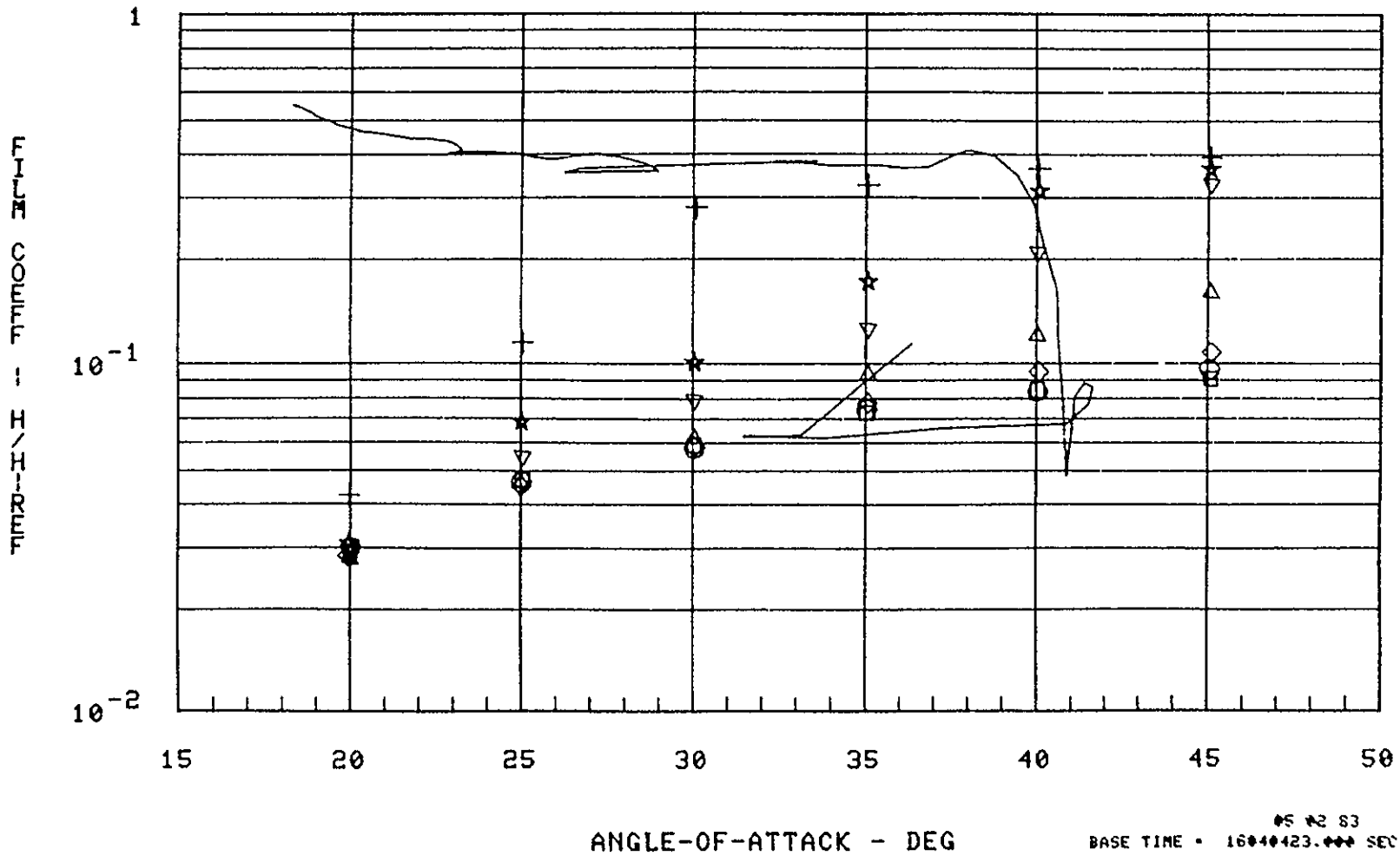
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# STS-4 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

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B-304

C-5



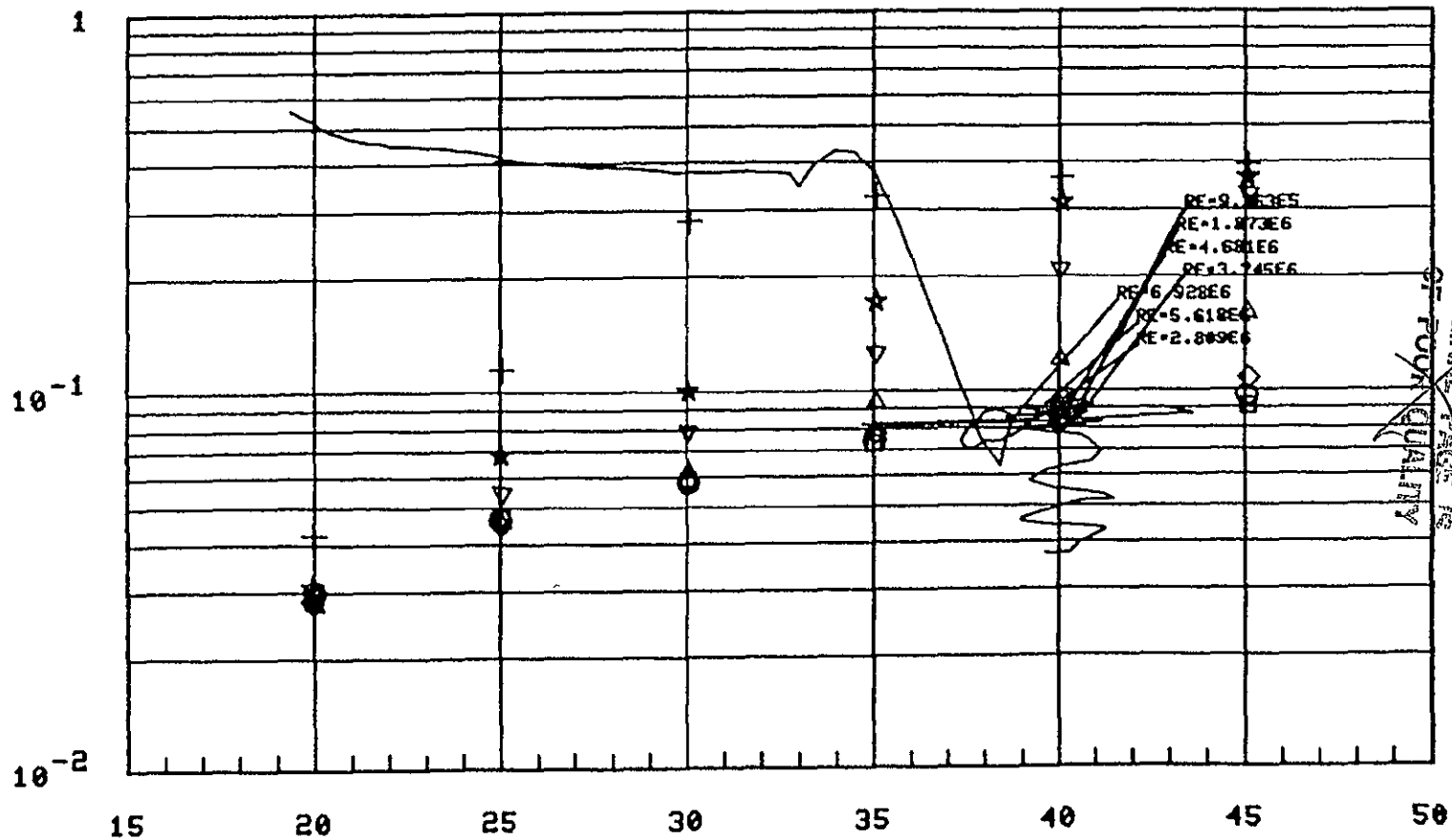
# STS-5 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISON

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OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
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OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9761A/H-REF 150-1350 SEC

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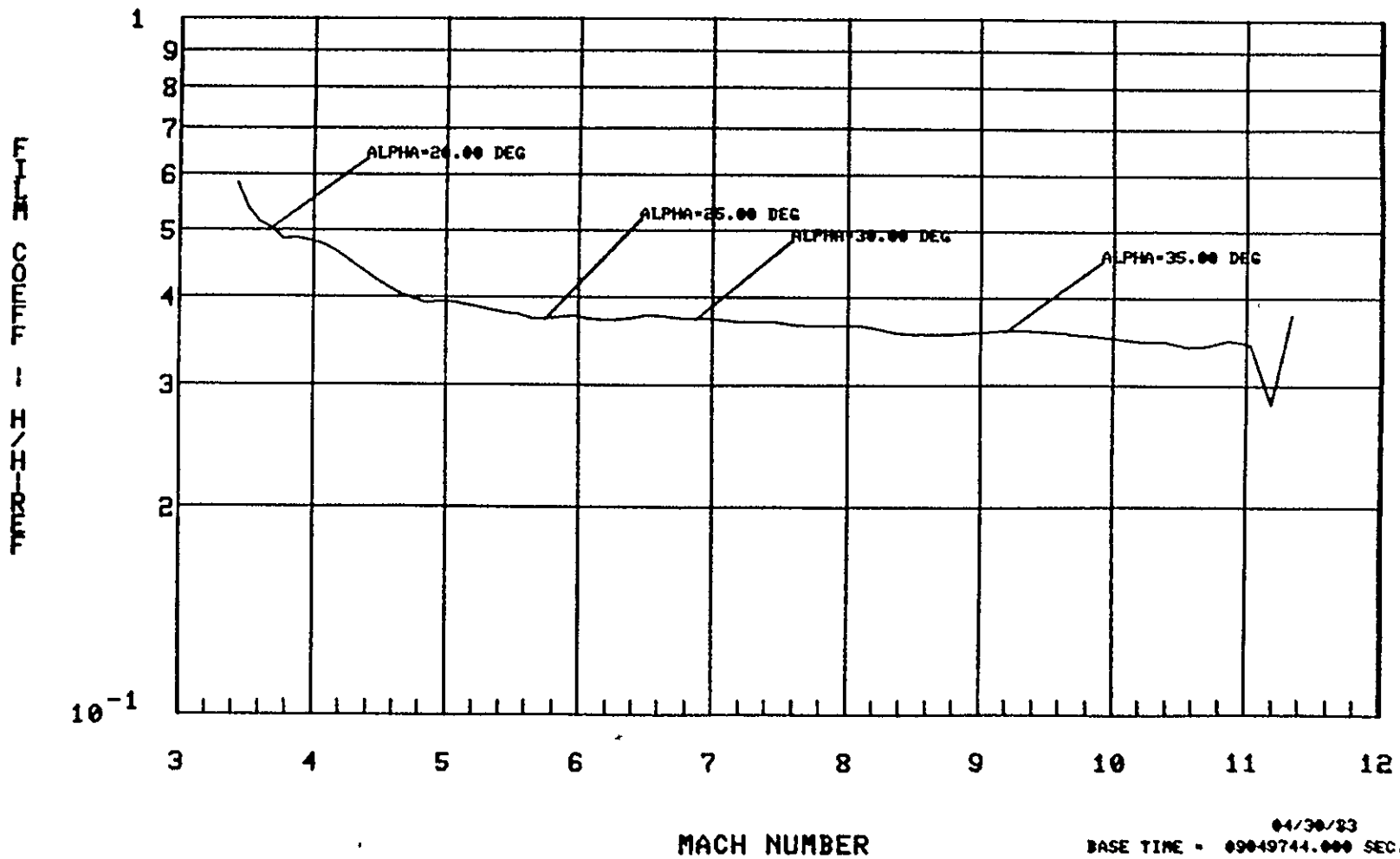
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04/28/83

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U09T9761A/H-REF 1065-1460 SEC

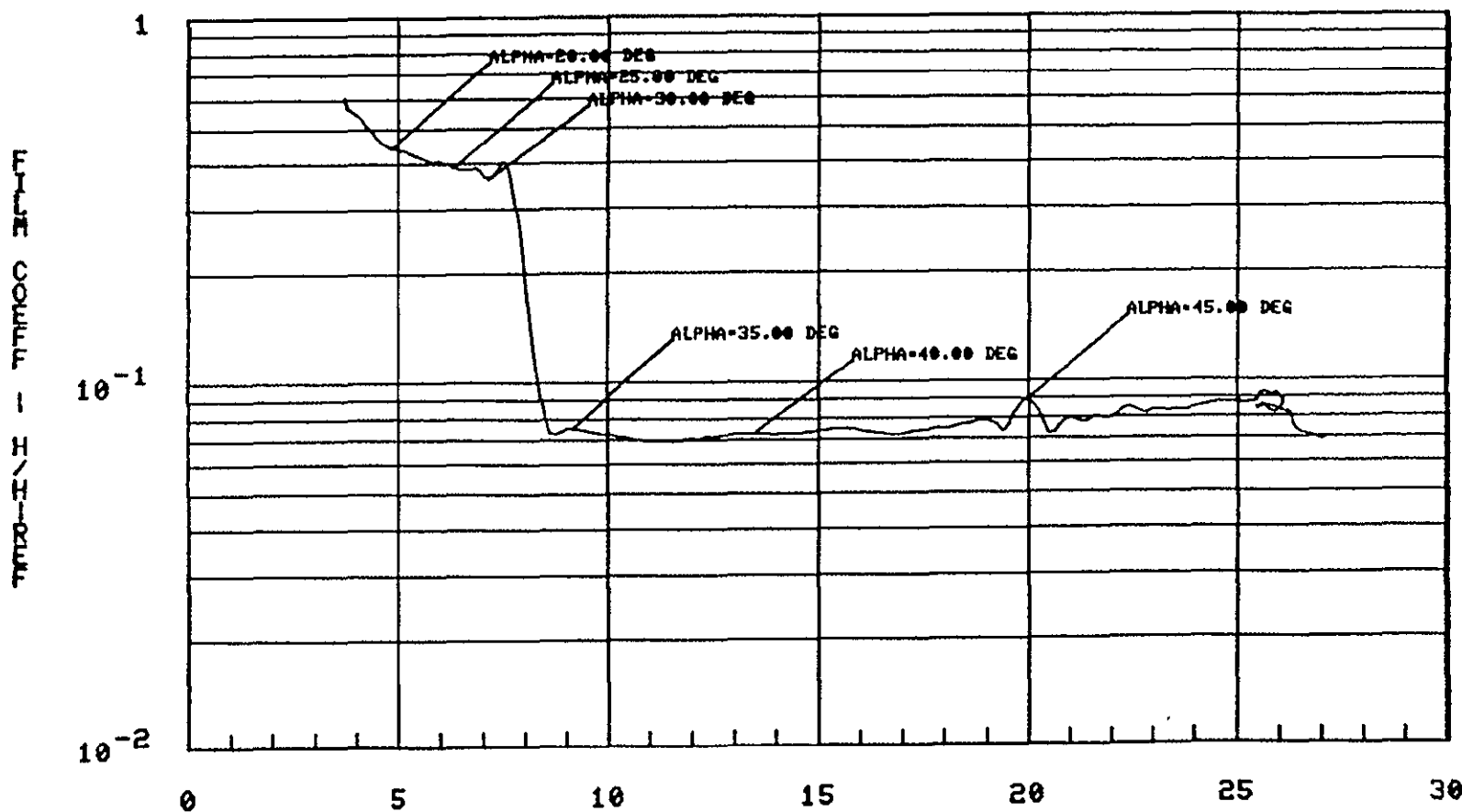


B-306

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B-307

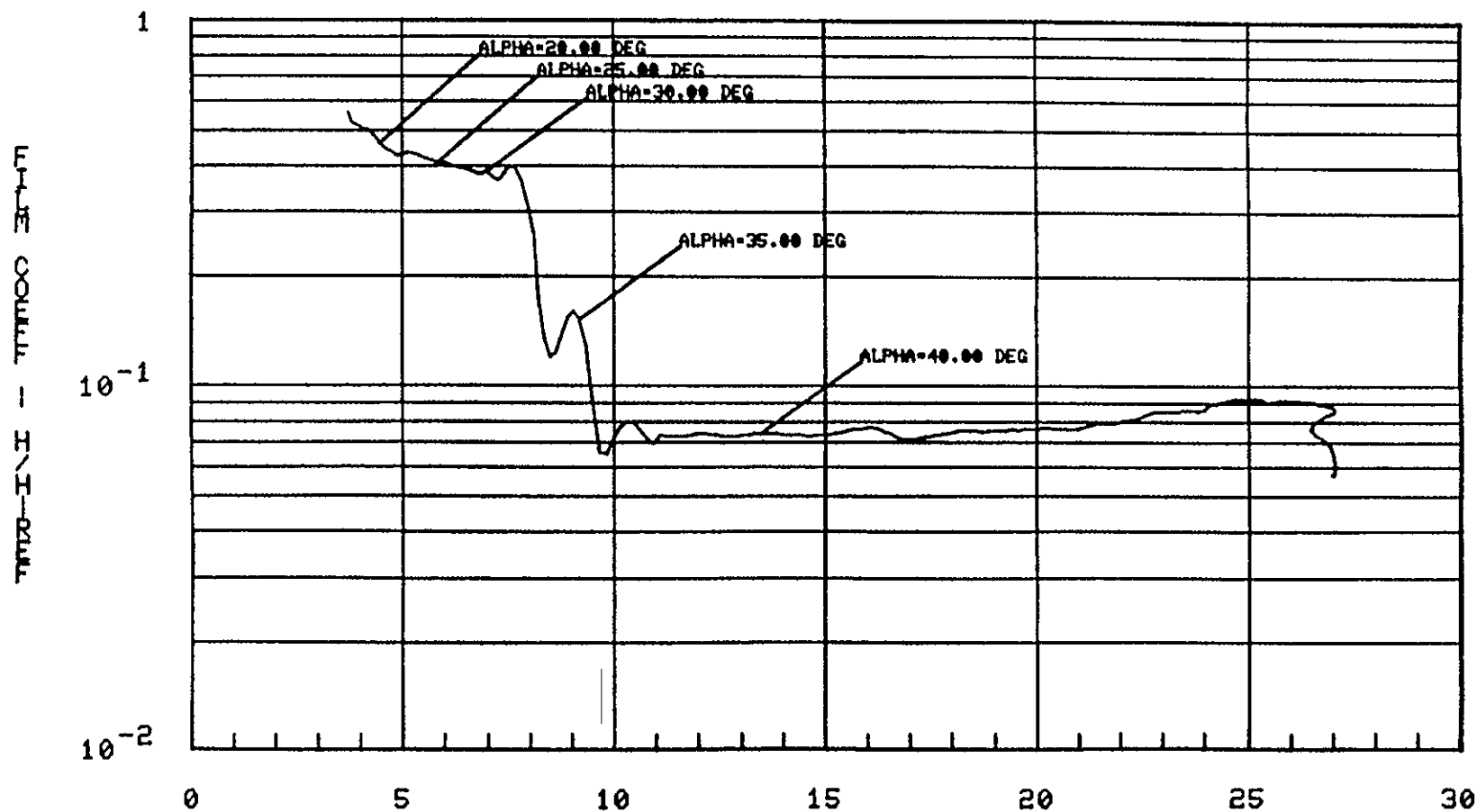
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04/30/83  
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U09T9761A/H-REF 200-1380 SEC



B-308

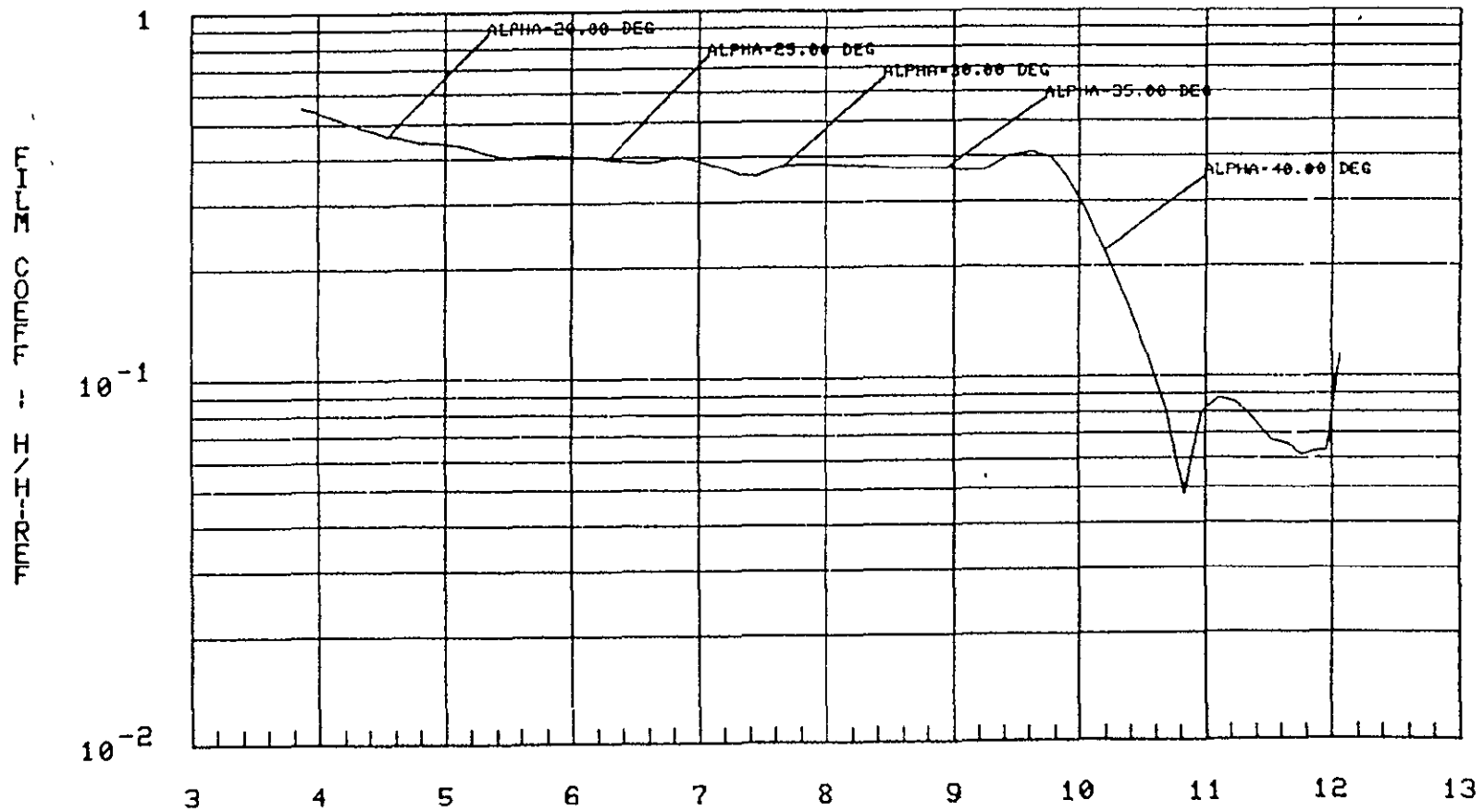
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U09T9761A/H-REF 965-1300 SEC



B-309

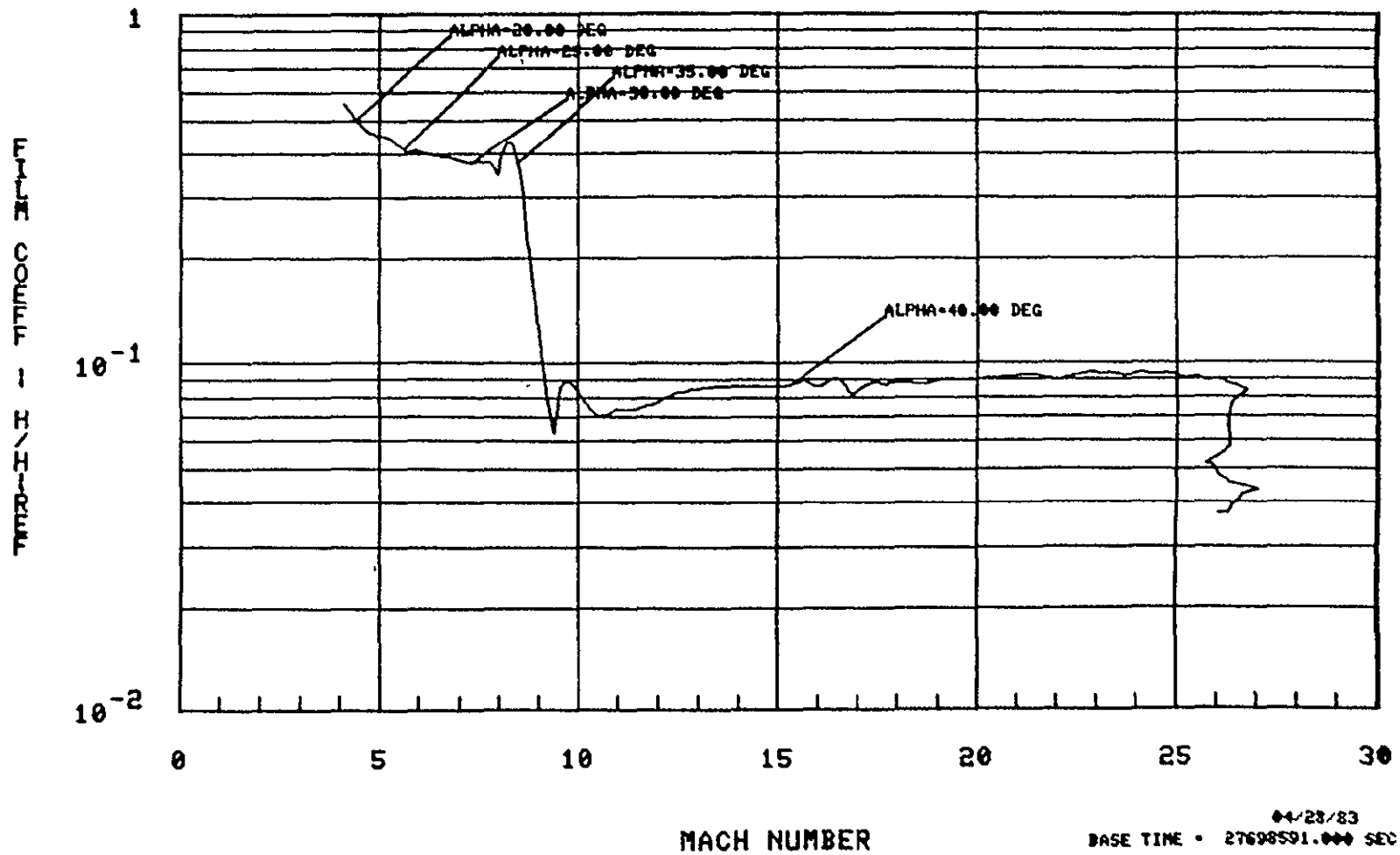
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# STS-5 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISON

U09T9761A/H-REF 150-1350 SEC



B-370

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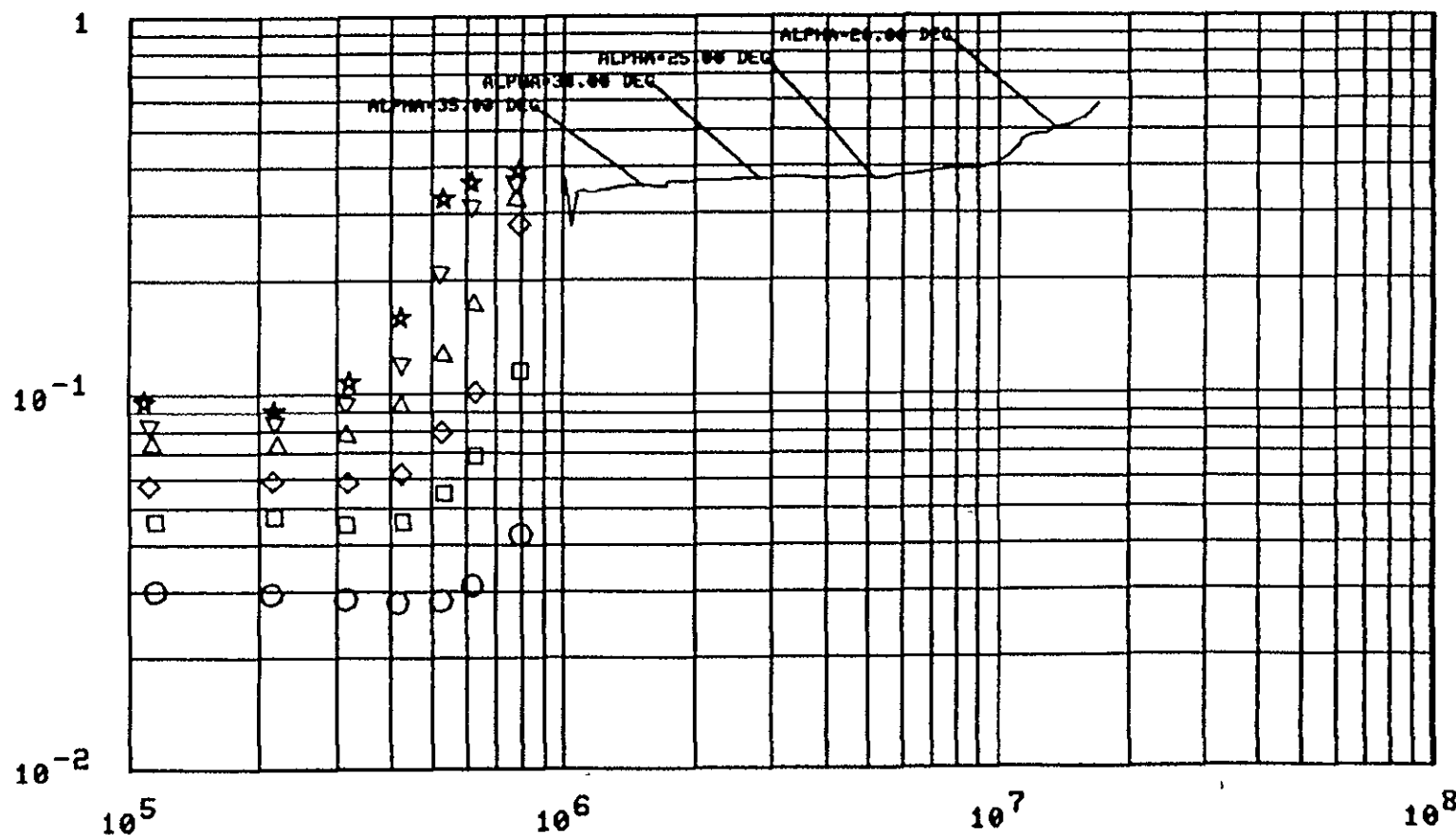
# STS-1 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

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OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9761A/H-REF 1065-1460 SEC

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B-311

REYNOLDS NUMBER (NS)

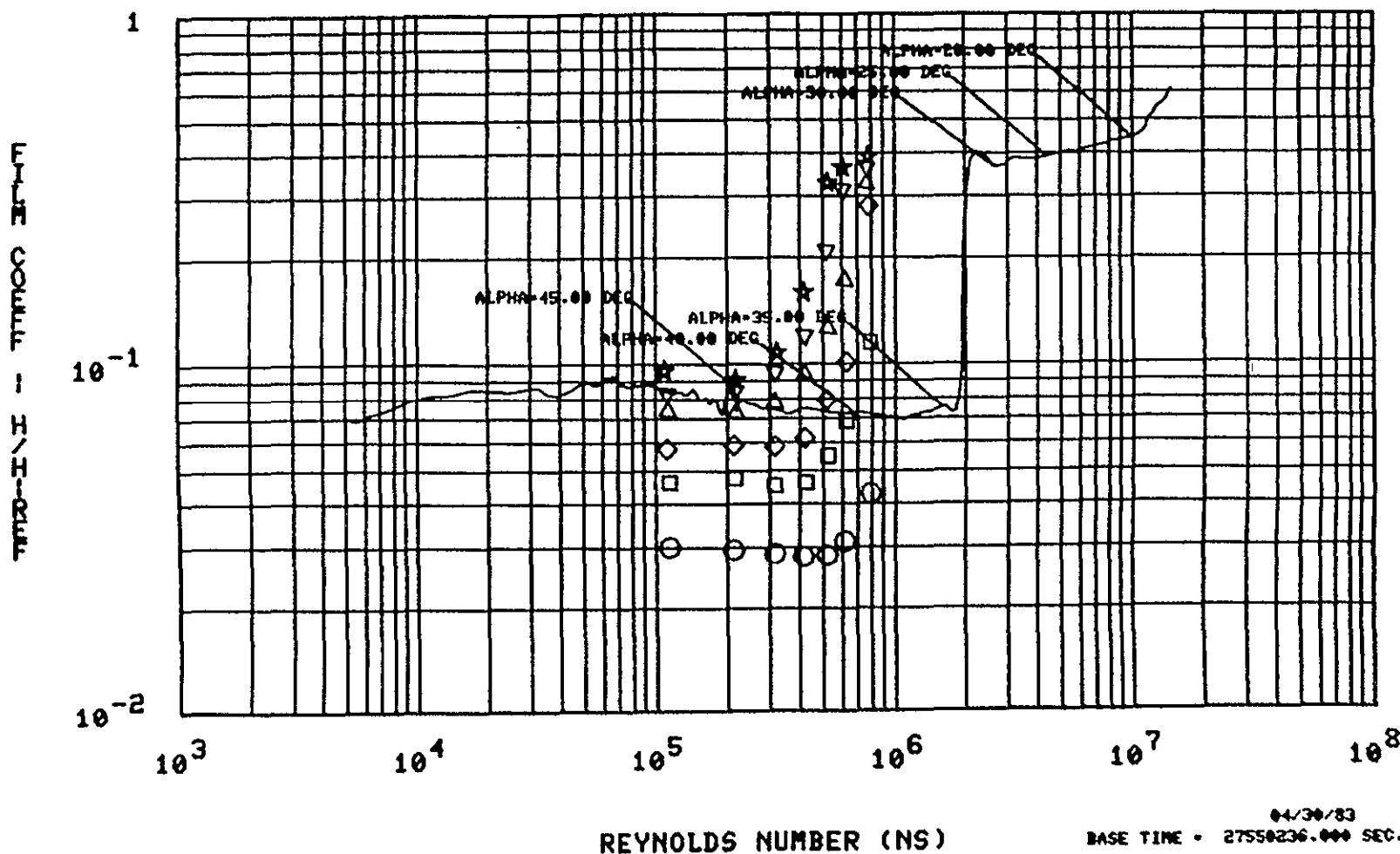
04/30/83  
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# STS-2 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9761A/H-REF 200-1480 SEC



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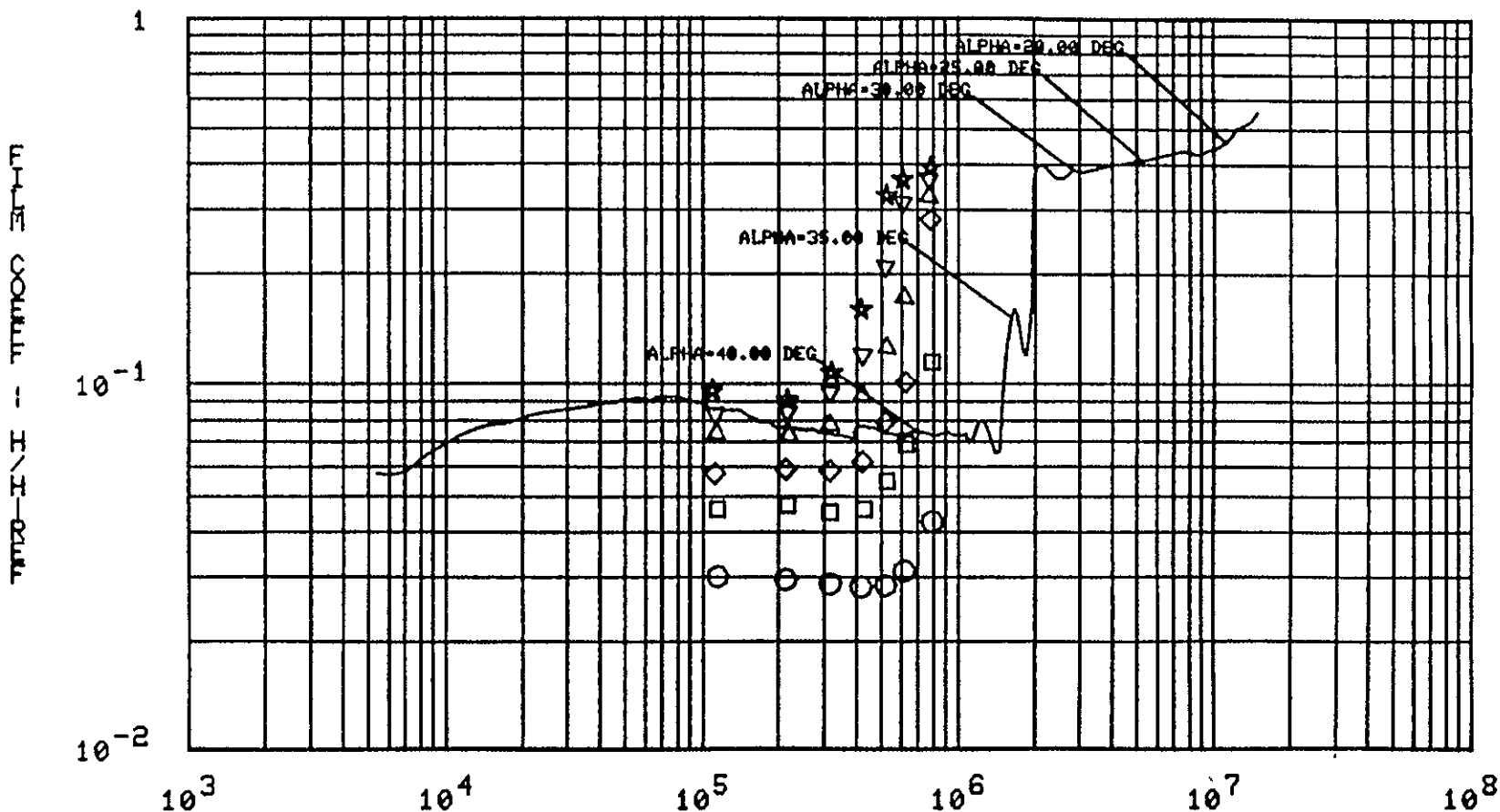


# STS-3 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9761A/H-REF 200-1380 SEC



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REYNOLDS NUMBER (NS)

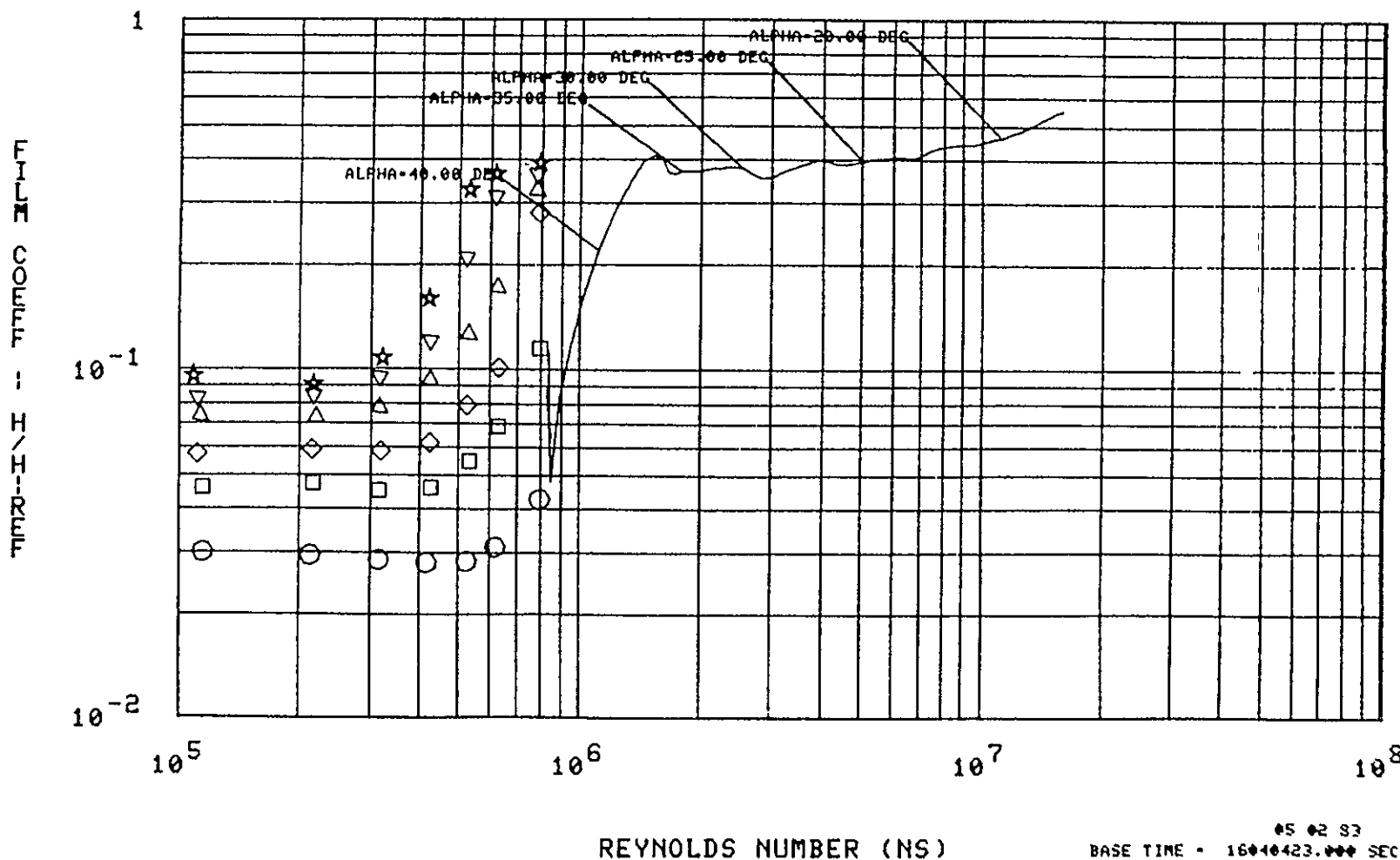
04/30/83  
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# STS-4 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9761A/H-REF 965-1300 SEC



B-314

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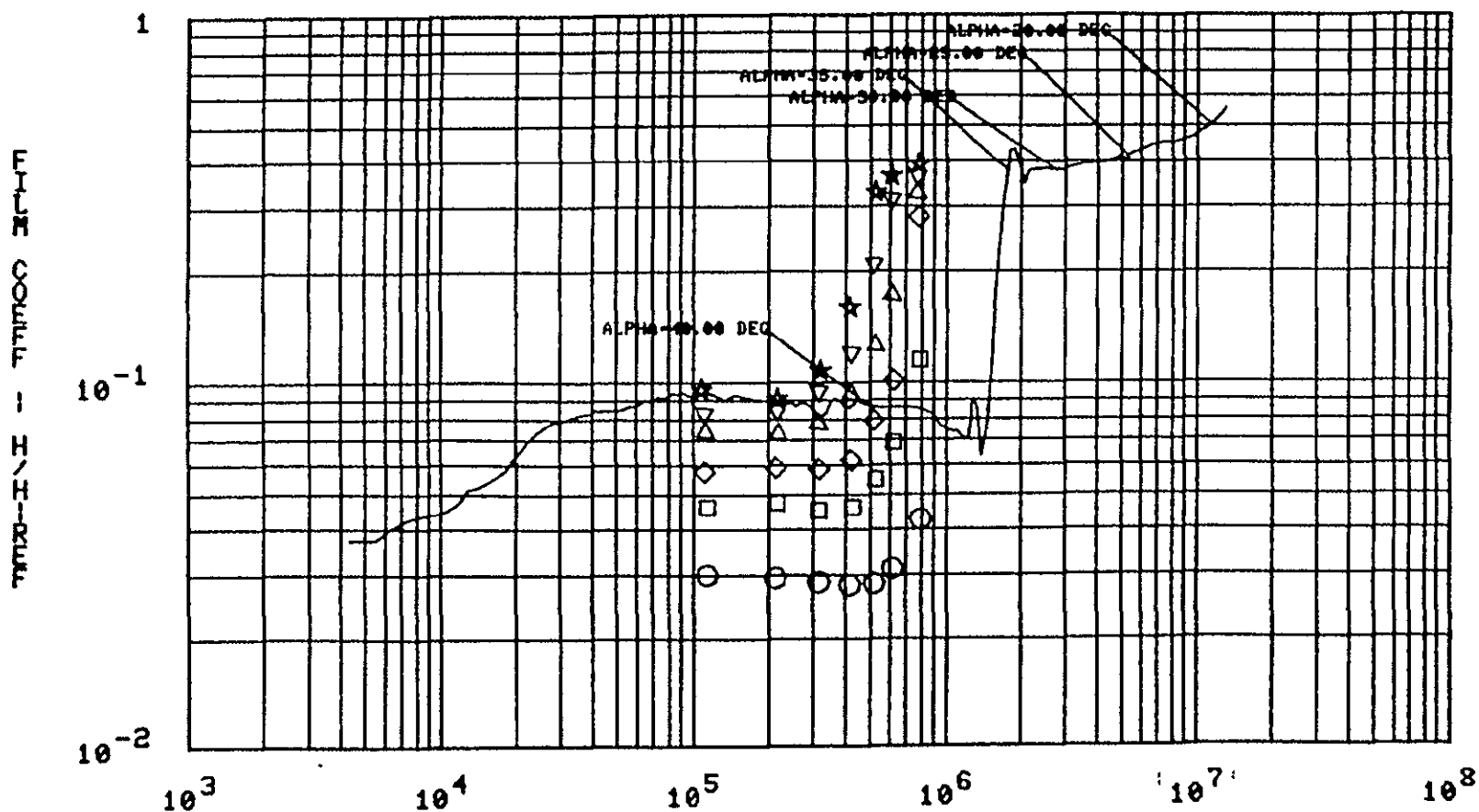
05 02 S3  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH49 ALPHA = 20 DEGREES  
OH49 ALPHA = 25 DEGREES  
OH49 ALPHA = 30 DEGREES  
OH49 ALPHA = 35 DEGREES  
OH49 ALPHA = 40 DEGREES  
OH49 ALPHA = 45 DEGREES

U09T9761A/H-REF 150-1350 SEC



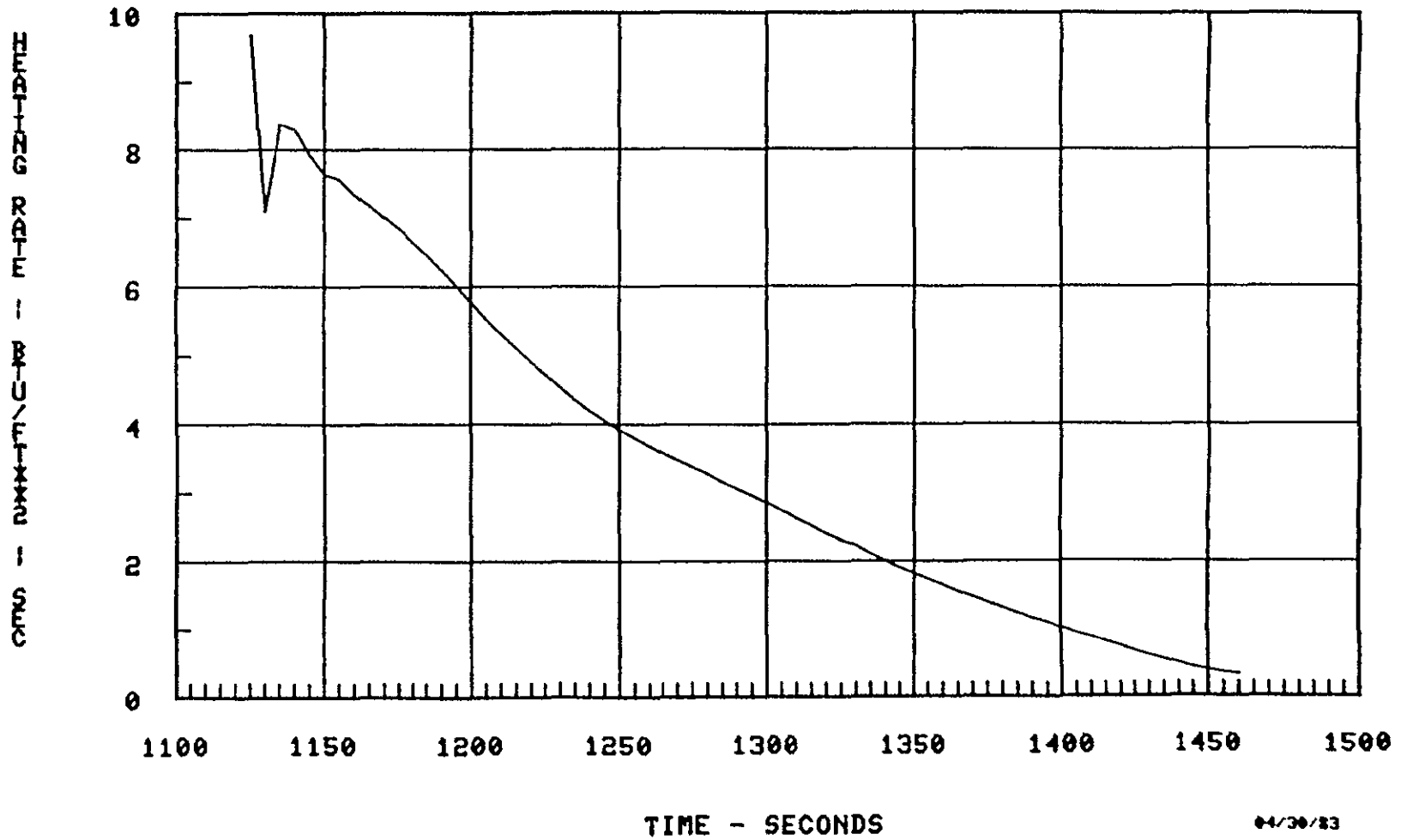
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# STS-1 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

———— V09T9761A



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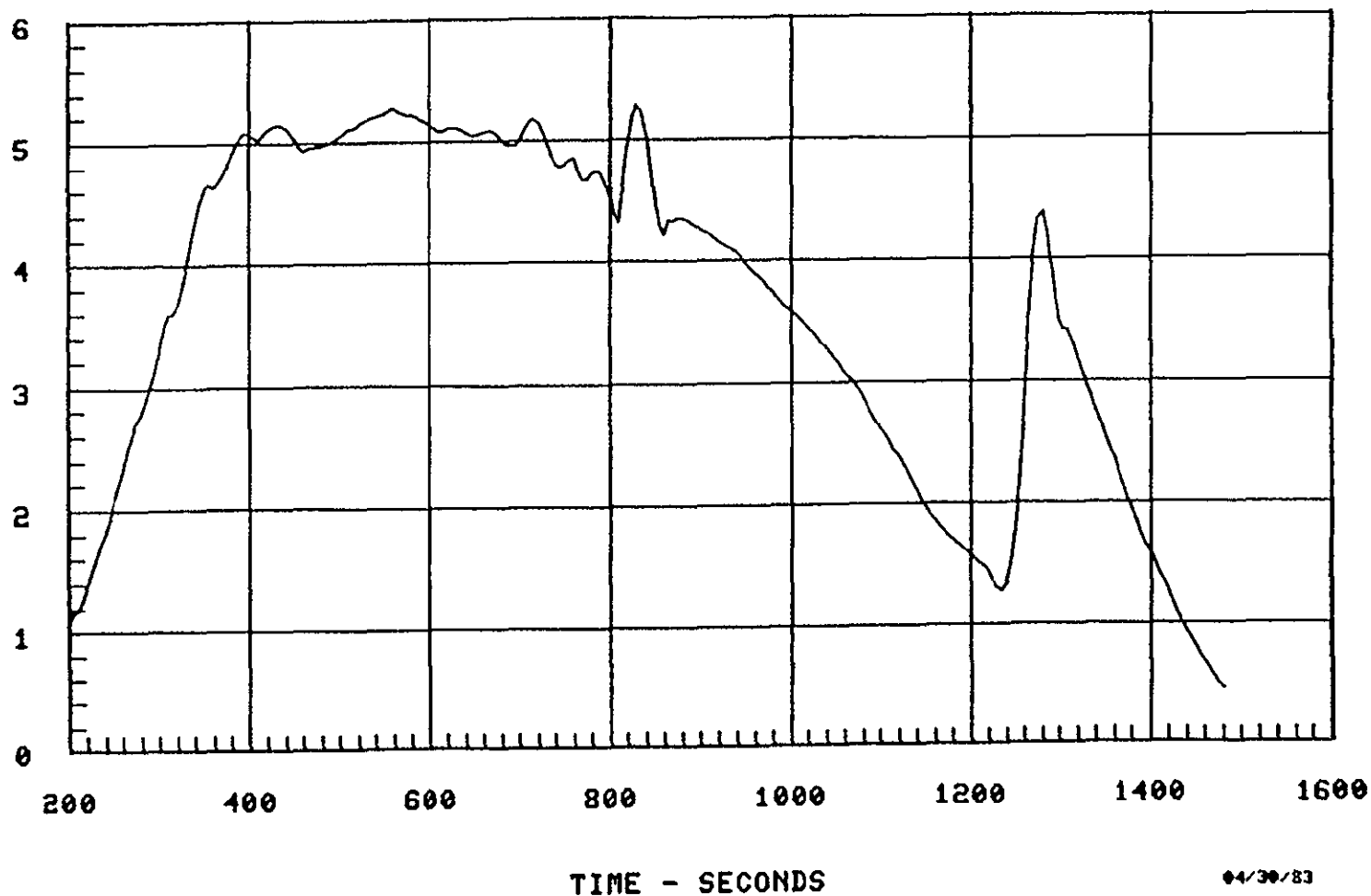
# STS-2 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A

INTEGRATED - B-317 - SMC

B-317

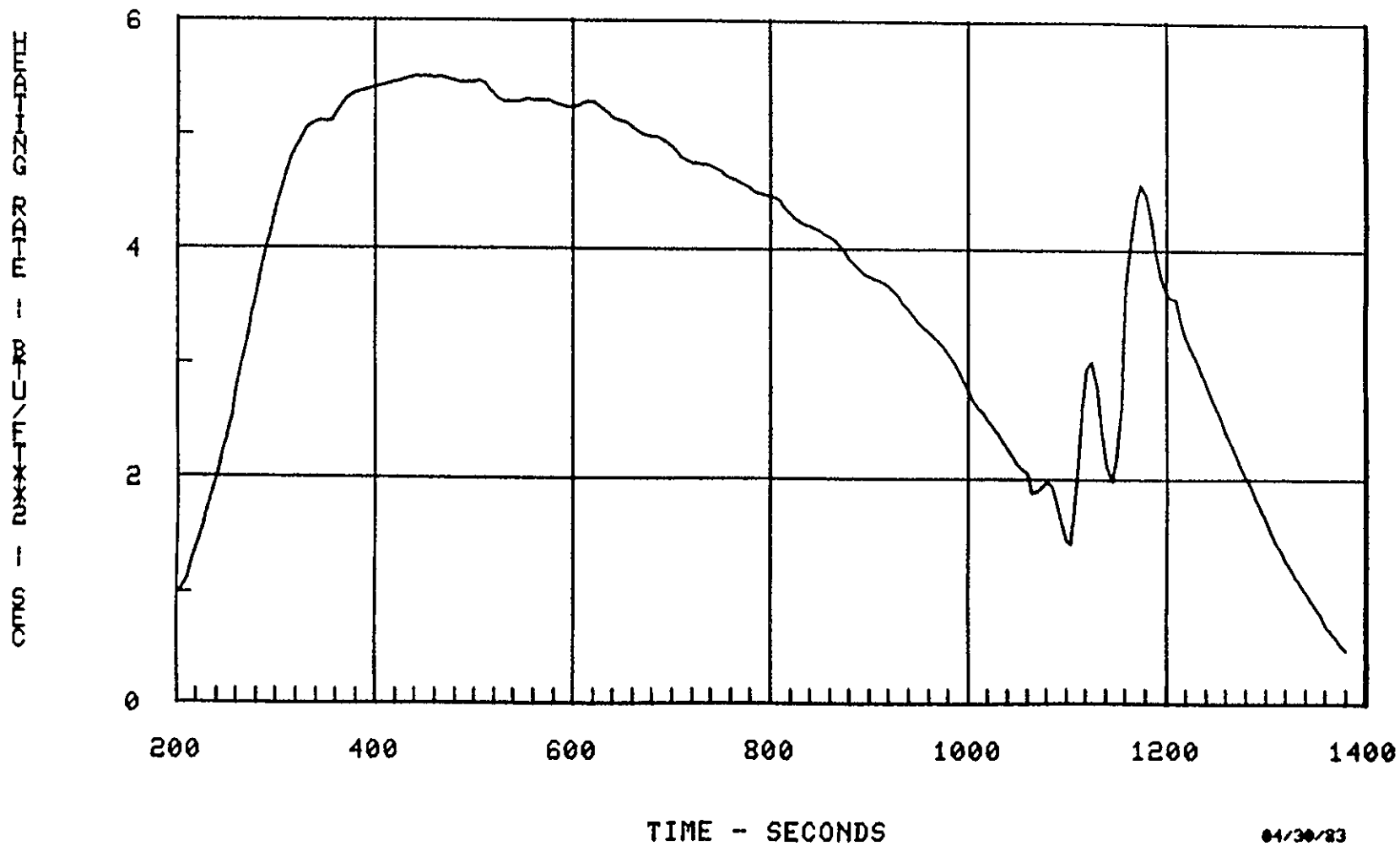
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04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

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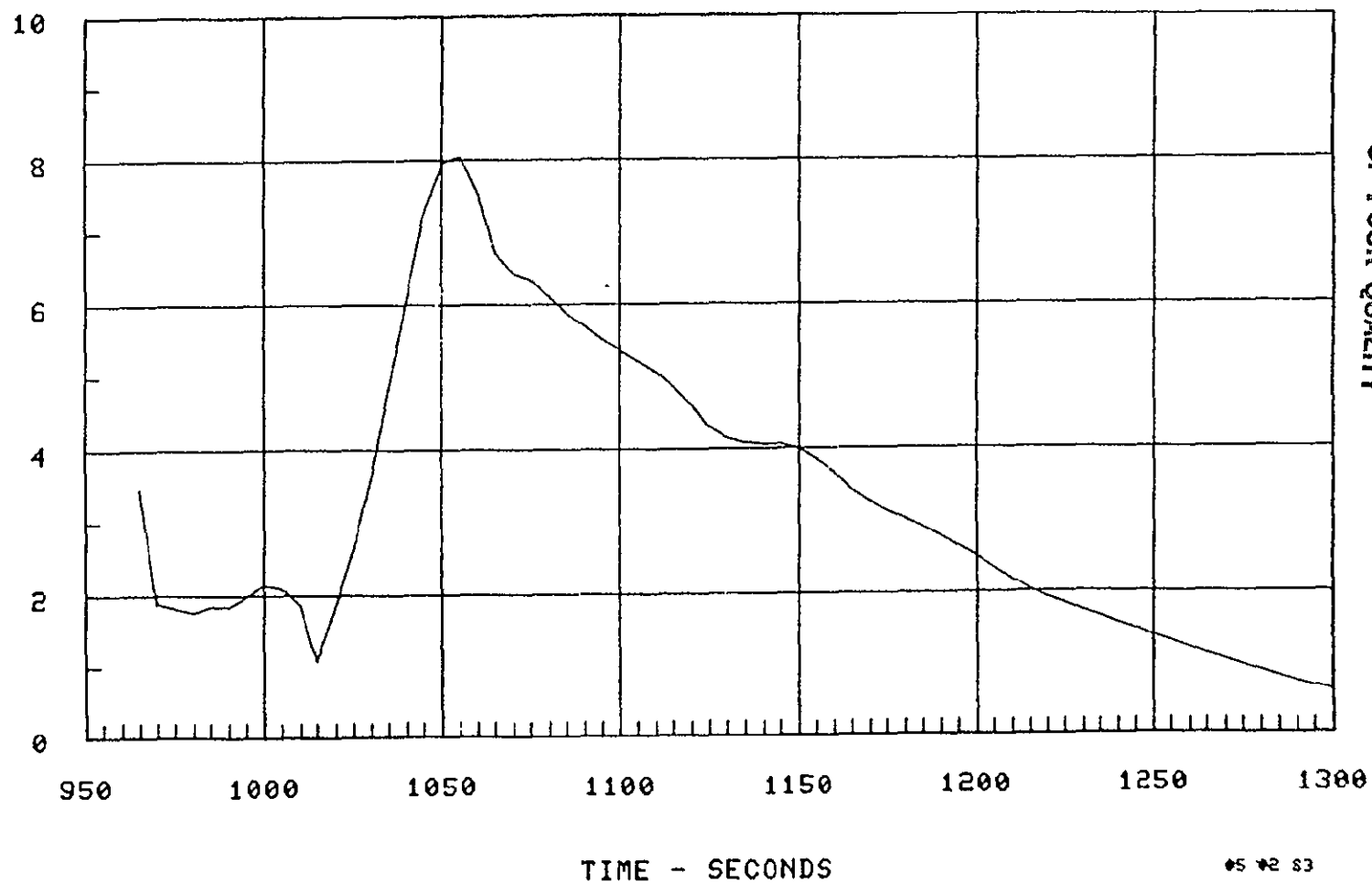
B-318

04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A

INTEGRATED RCM -- B-319 -- SMC

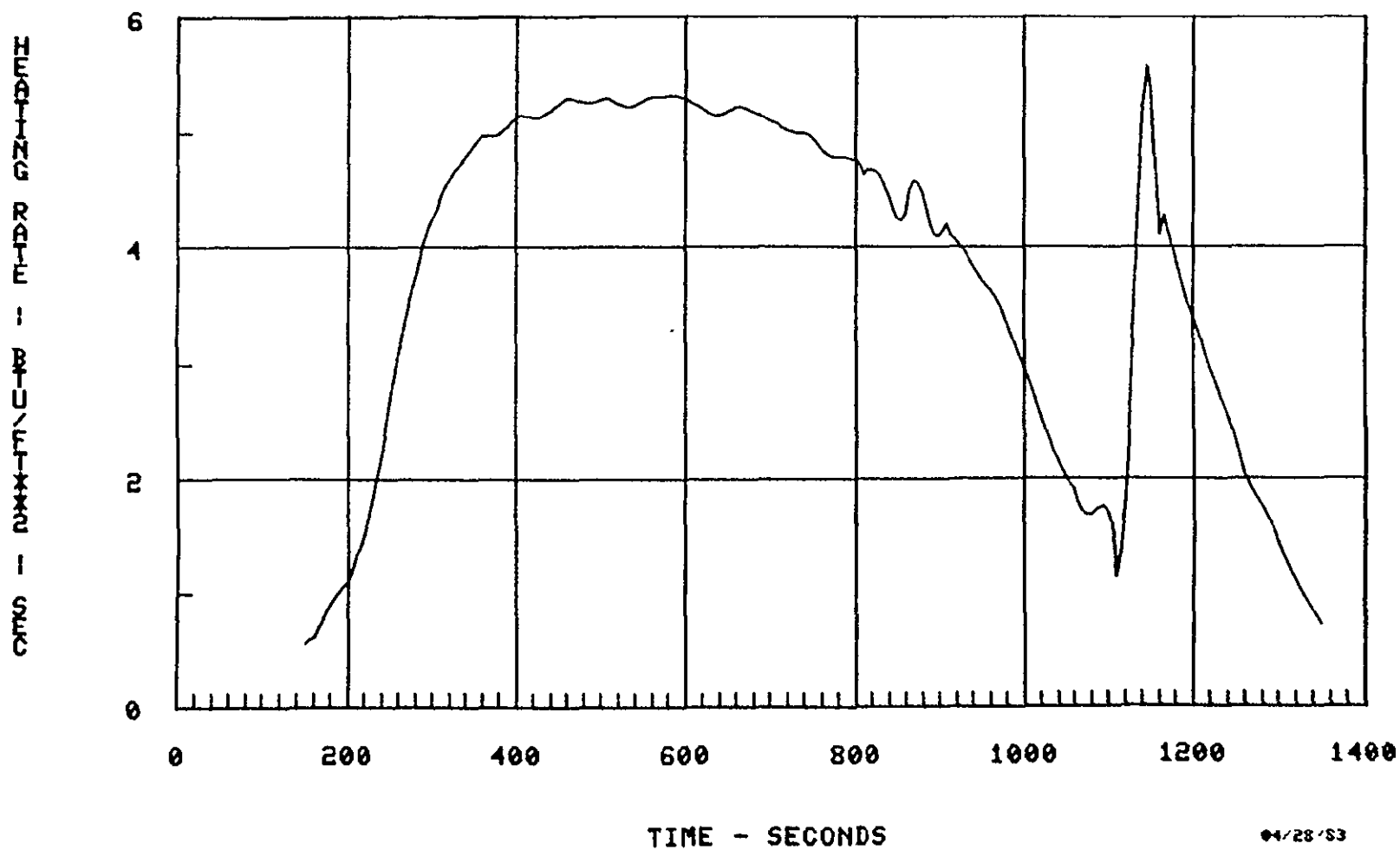


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B-319

# STS-5 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A

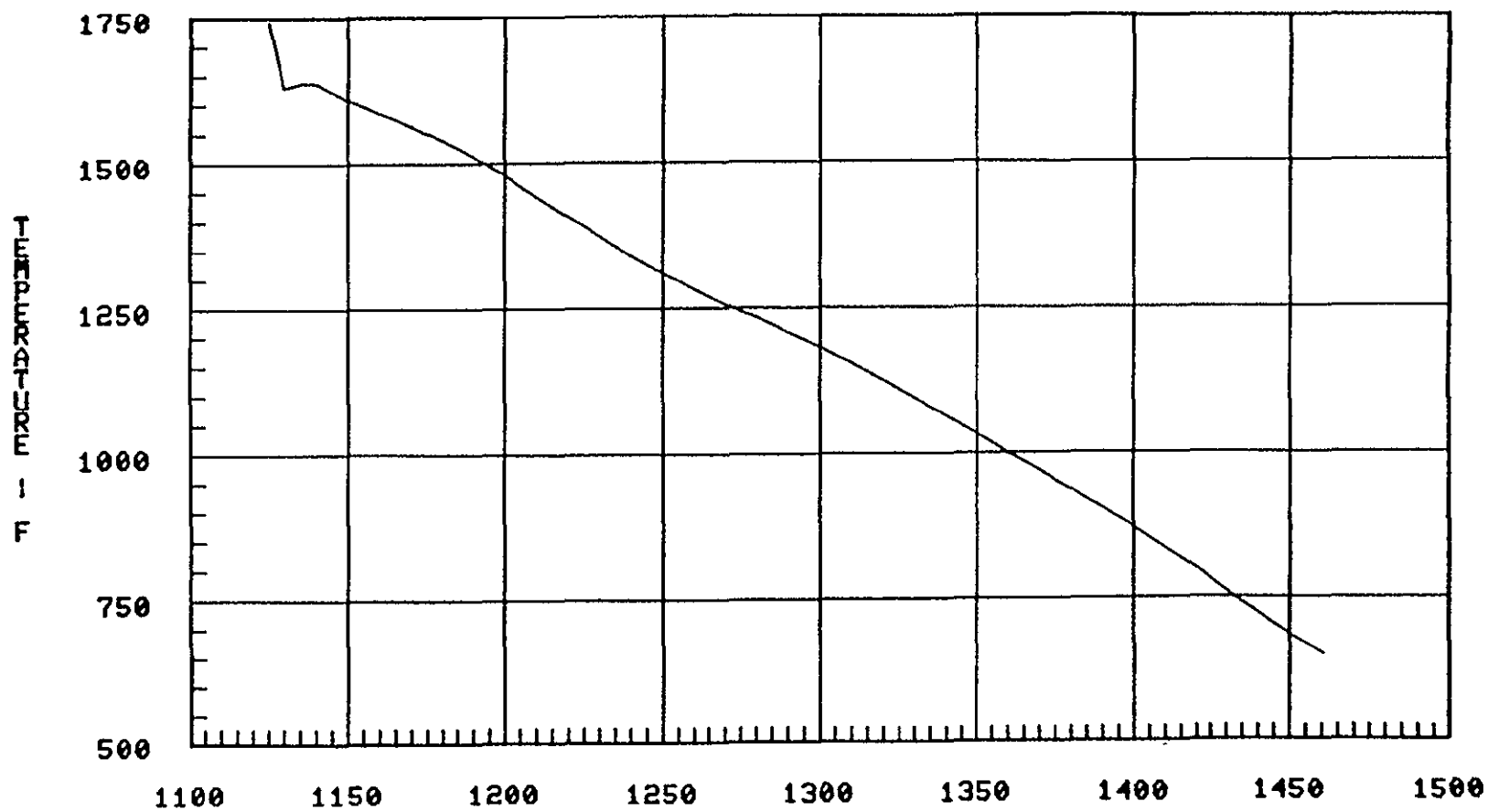


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# STS-1 (107 FT LENGTH CL $X/L=0.81$ ) FLIGHT PARAMETER COMPARISO

U89T9761A



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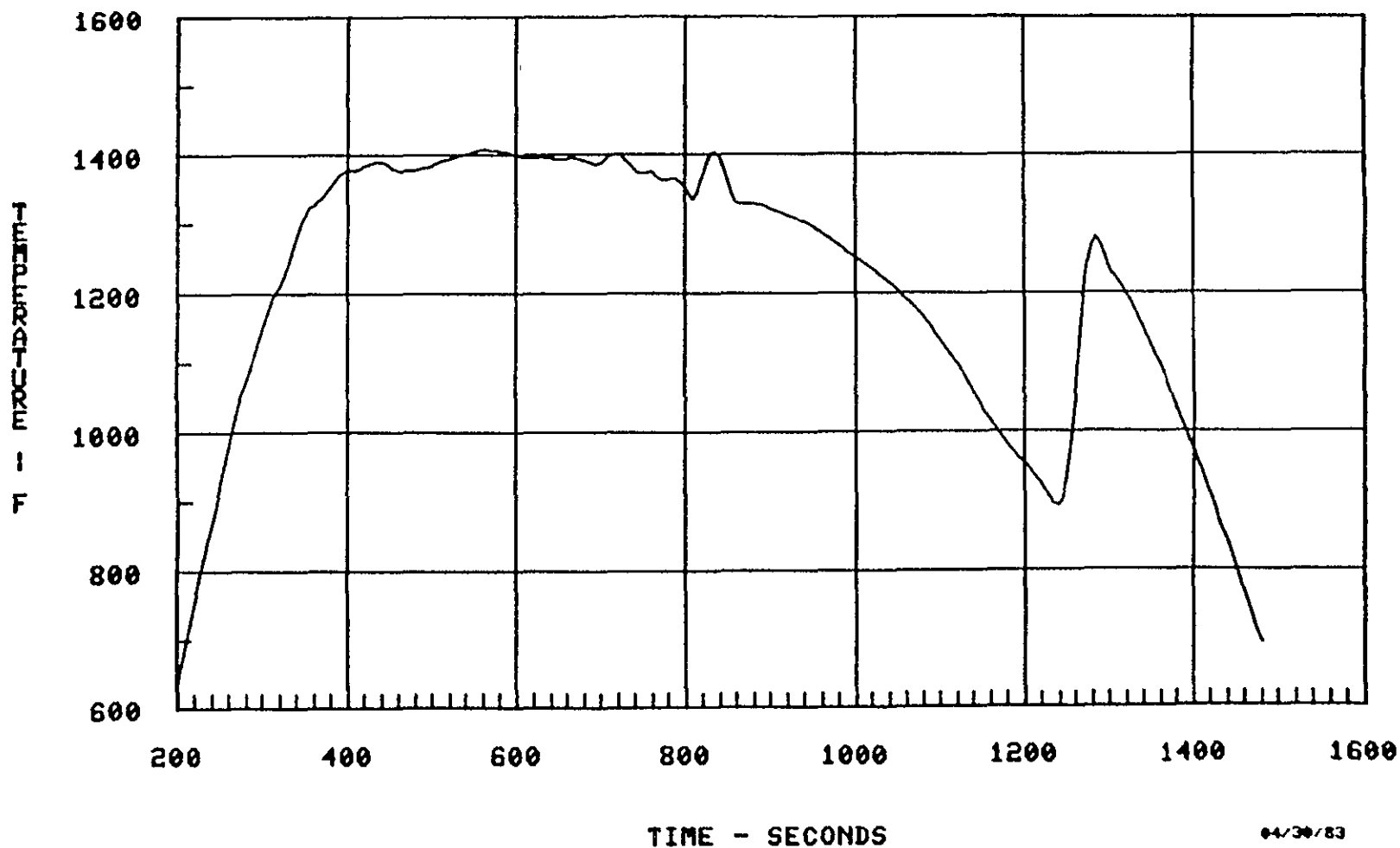
B-321

TIME - SECONDS

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A

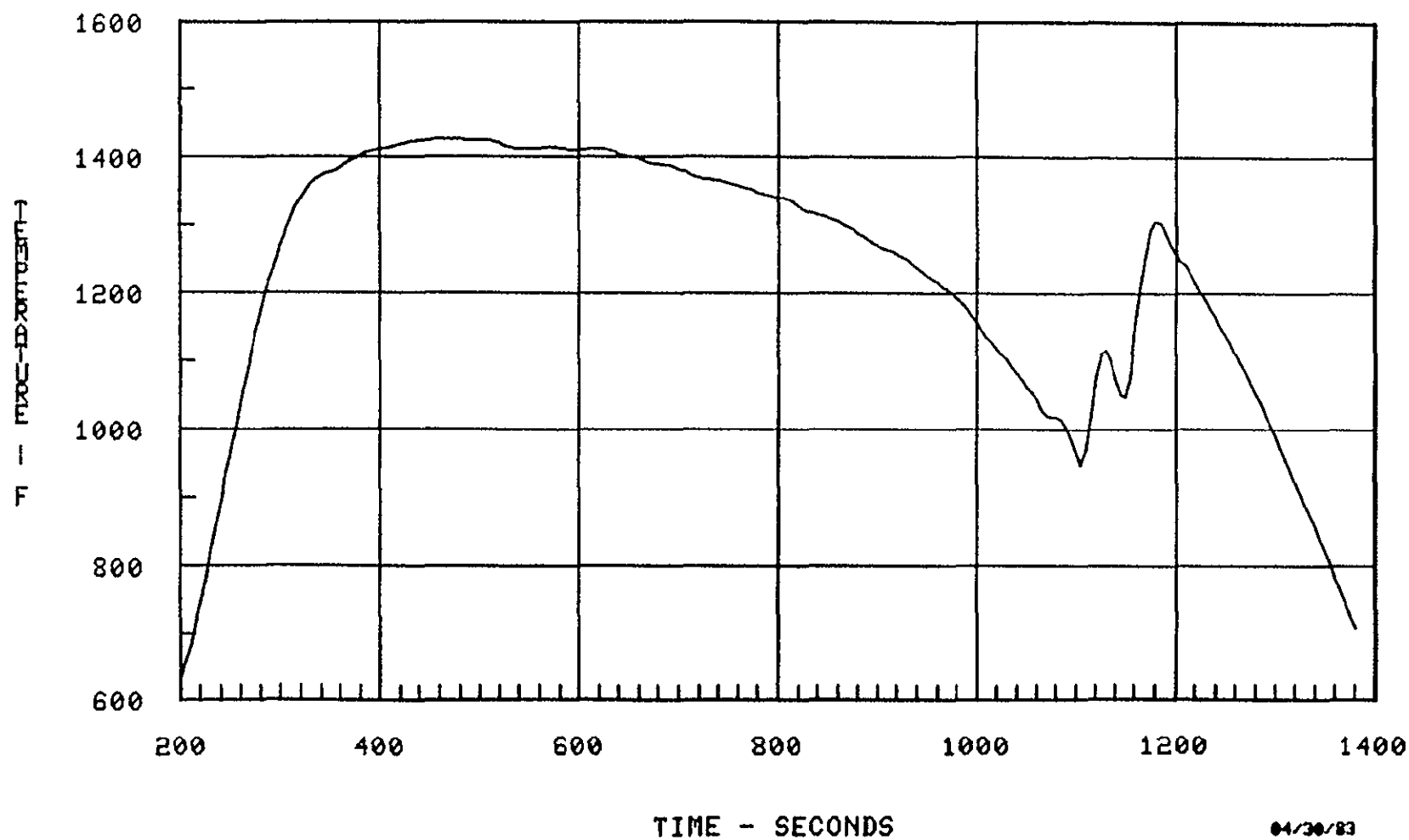


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04/30/83

# ST5-3 (107 FT LENGTH CL) FLIGHT PARAMETER COMPARISON

U09T9761A



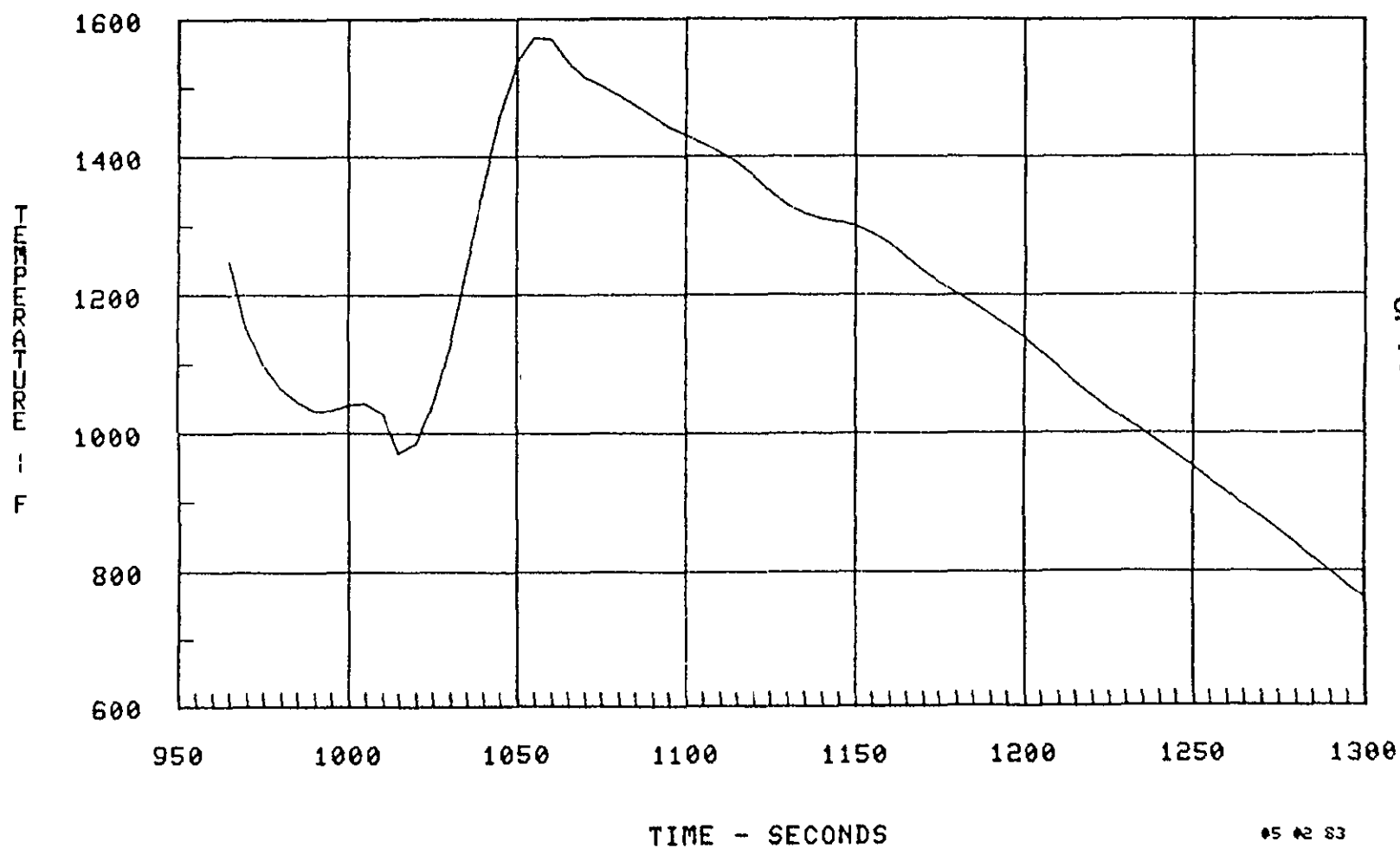
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B-323

04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A

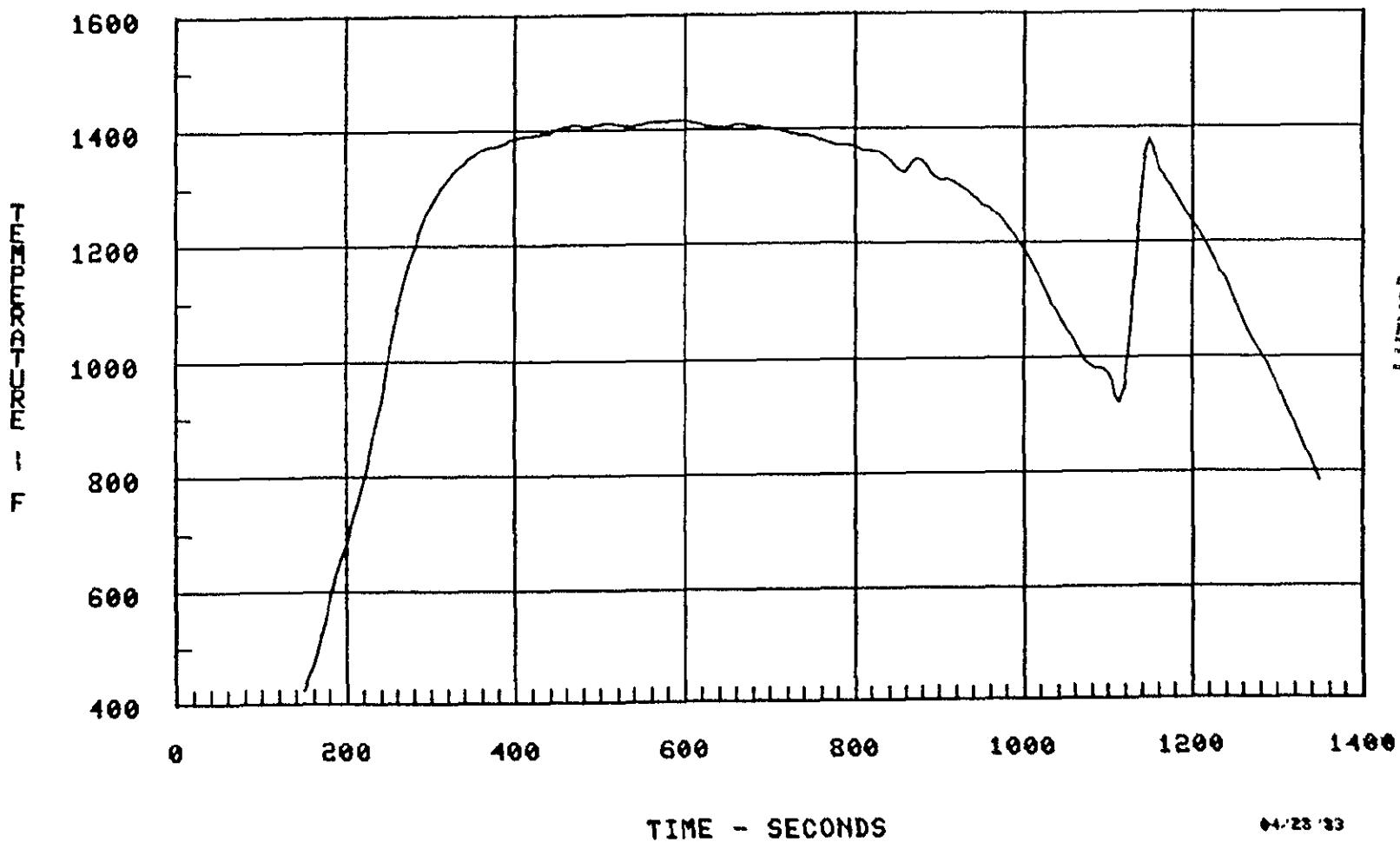


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B-324

# STS-5 (107 FT LENGTH CL X/L=0.81) FLIGHT PARAMETER COMPARISO

U09T9761A



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B-325

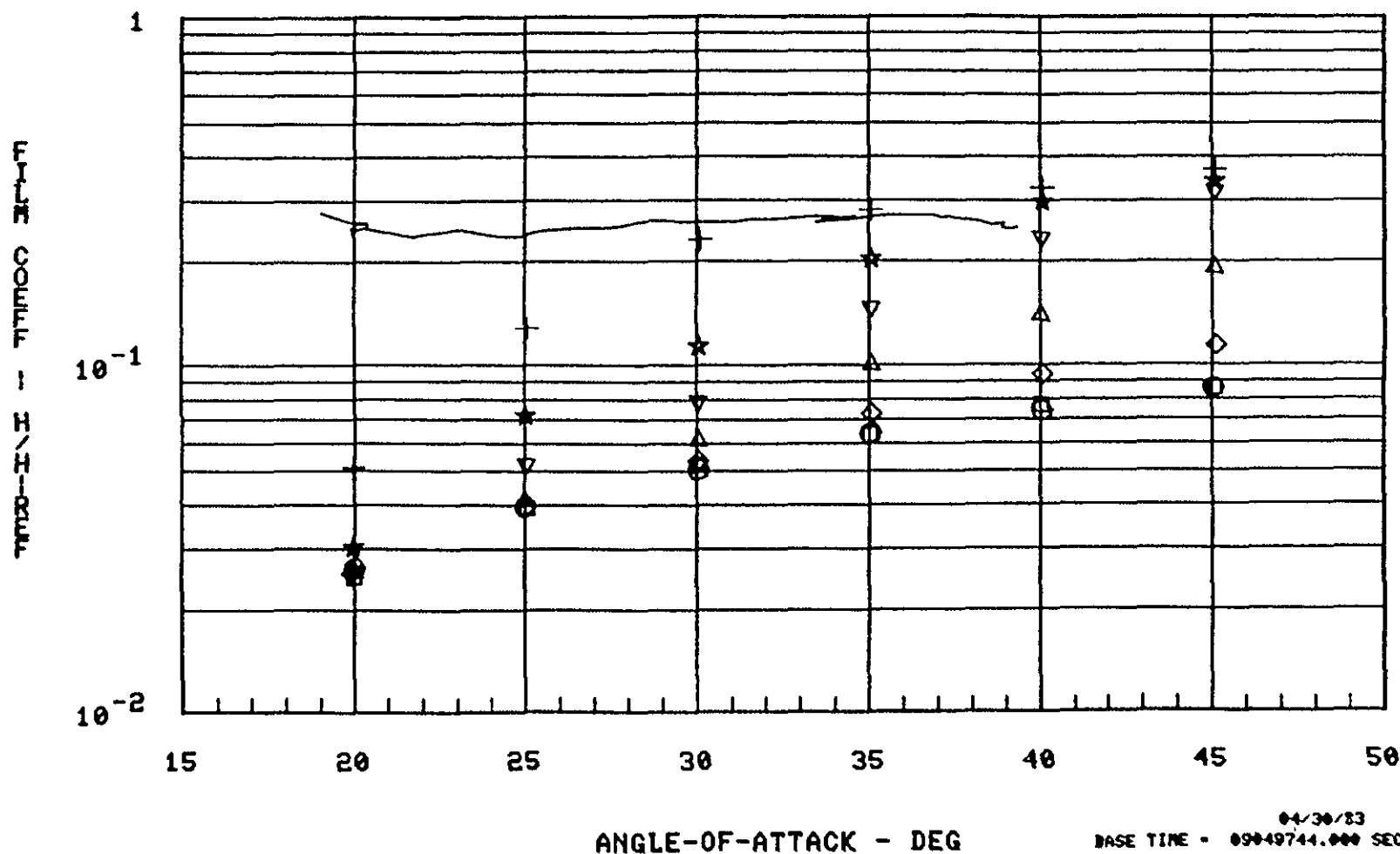
04/25/83

# STS-1 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
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△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9489A/H-REF 1065-1460 SEC



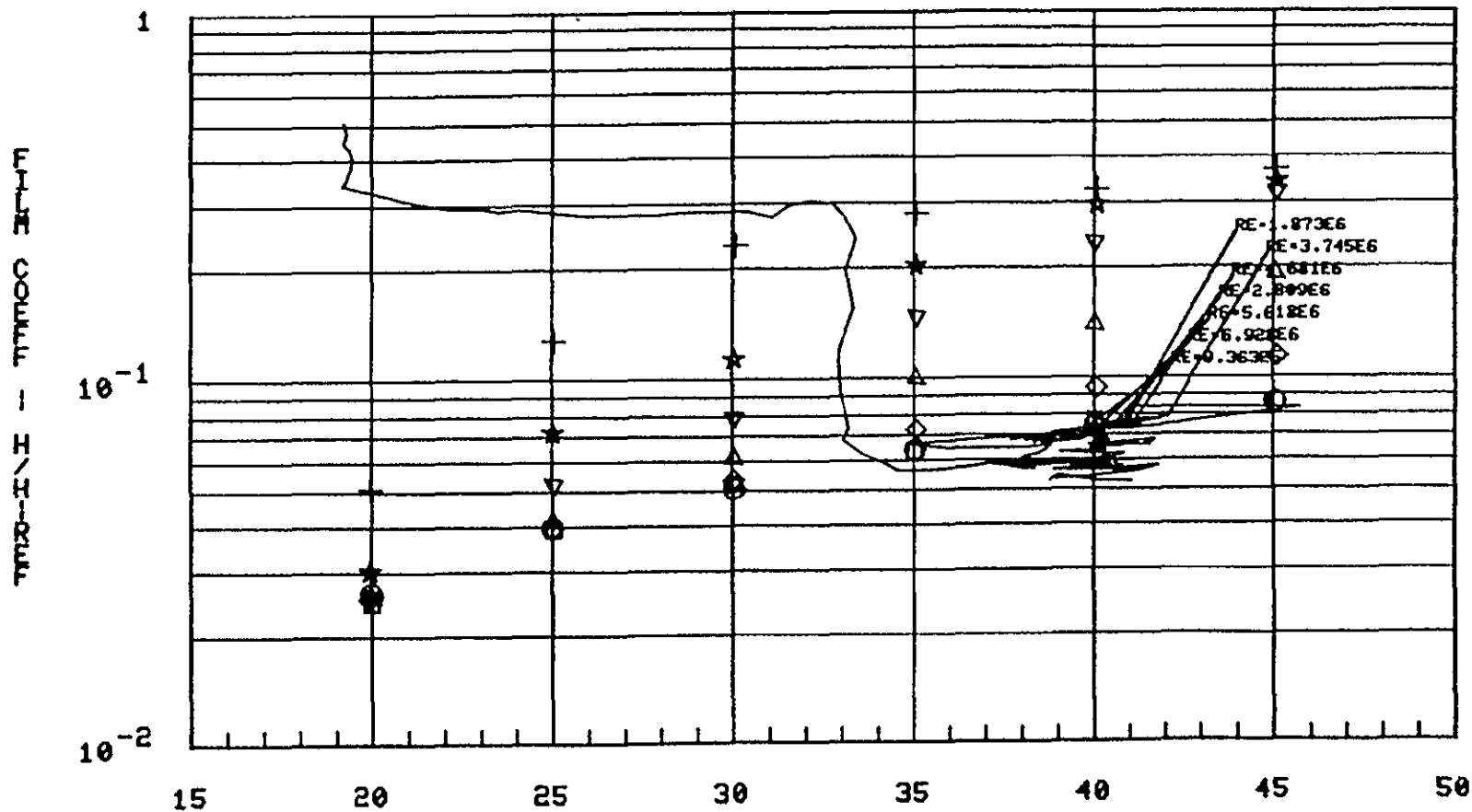
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# STS-2 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9489A/H-REF 200-1480 SEC



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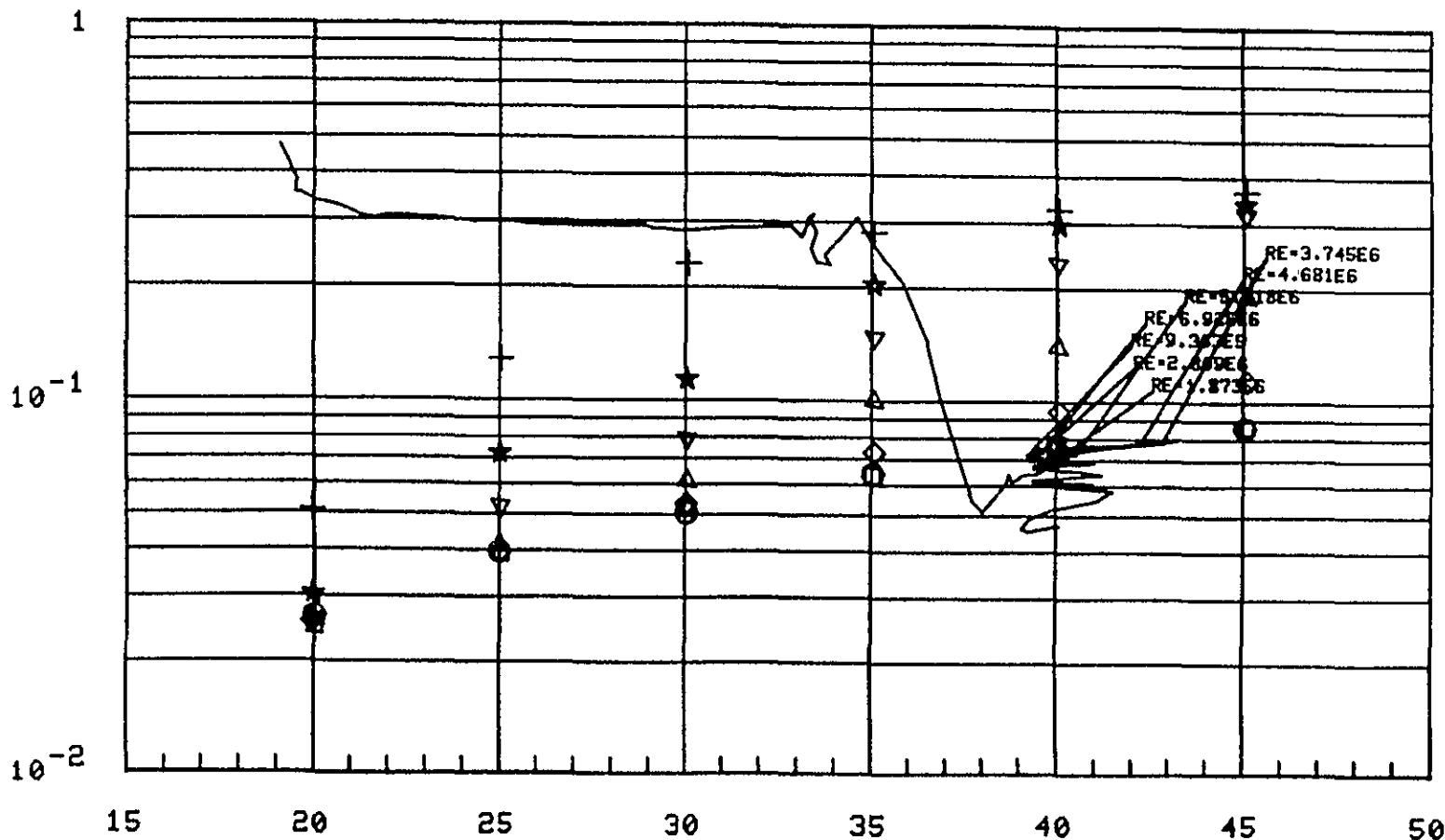
# ST5-3 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U07T9489A/H-REF 200-1380 SEC

LINE COUNT - I/I-QUAL



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ANGLE-OF-ATTACK - DEG

04/30/83  
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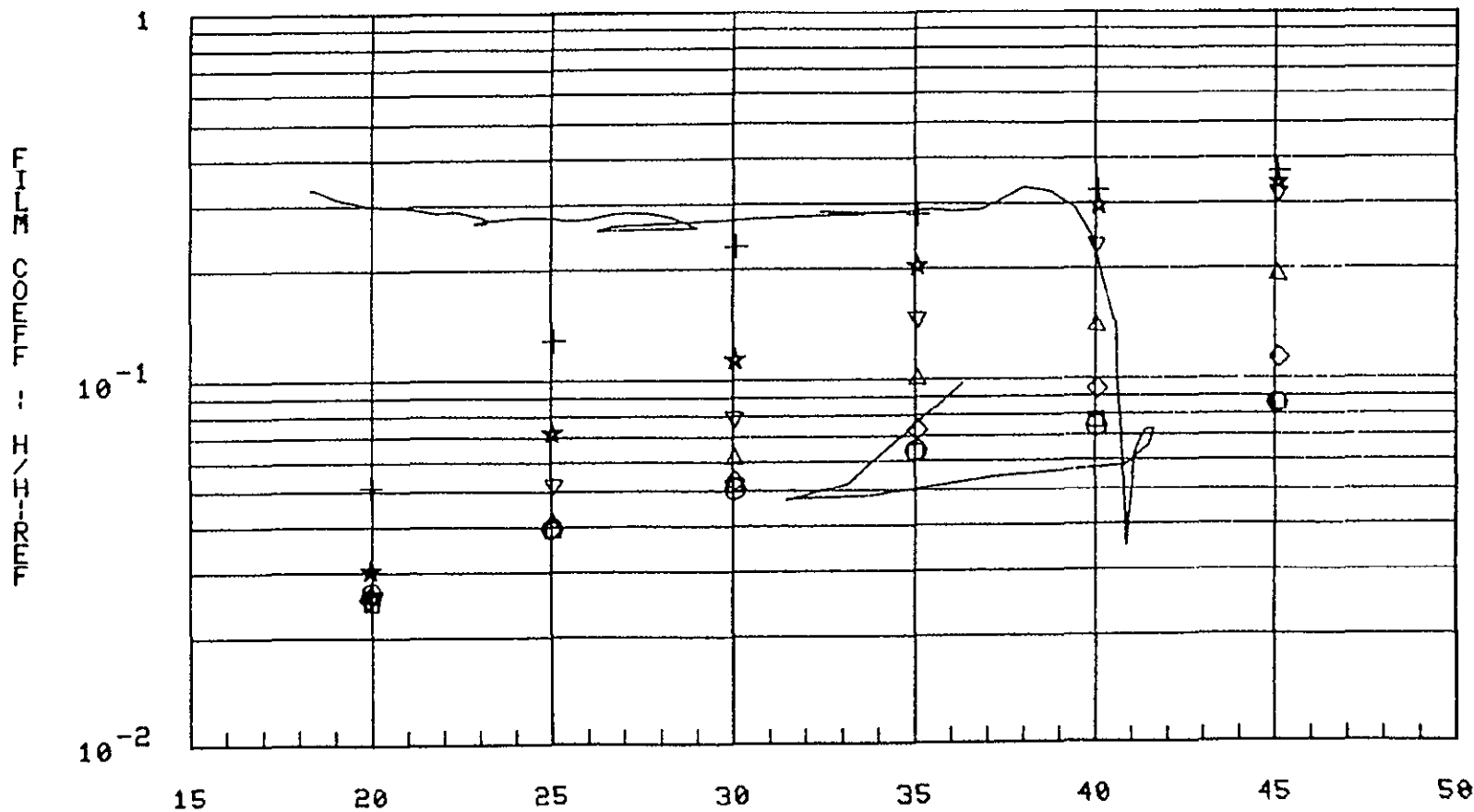


# STS-4 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE \* 0.5 E06  
OH49 0.0175 SCALE RE \* 1.0 E06  
OH49 0.0175 SCALE RE \* 1.5 E06  
OH49 0.0175 SCALE RE \* 2.0 E06  
OH49 0.0175 SCALE RE \* 2.5 E06  
OH49 0.0175 SCALE RE \* 3.0 E06  
OH49 0.0175 SCALE RE \* 3.7 E06

U07T9489A/H-REF 965-1300 SEC



B-329

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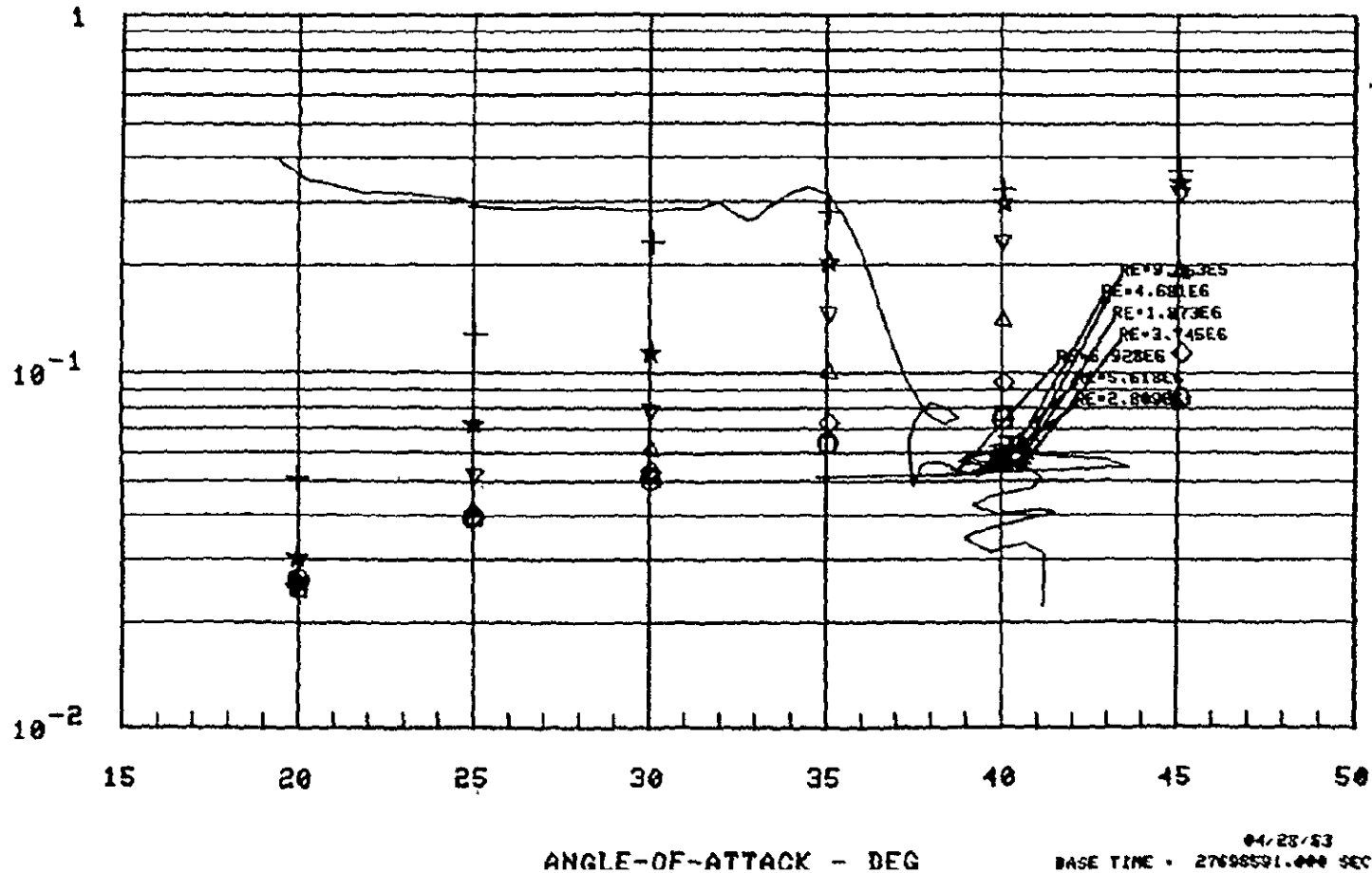
# STS-5 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U97T9489A/H-REF 150-1350 SEC

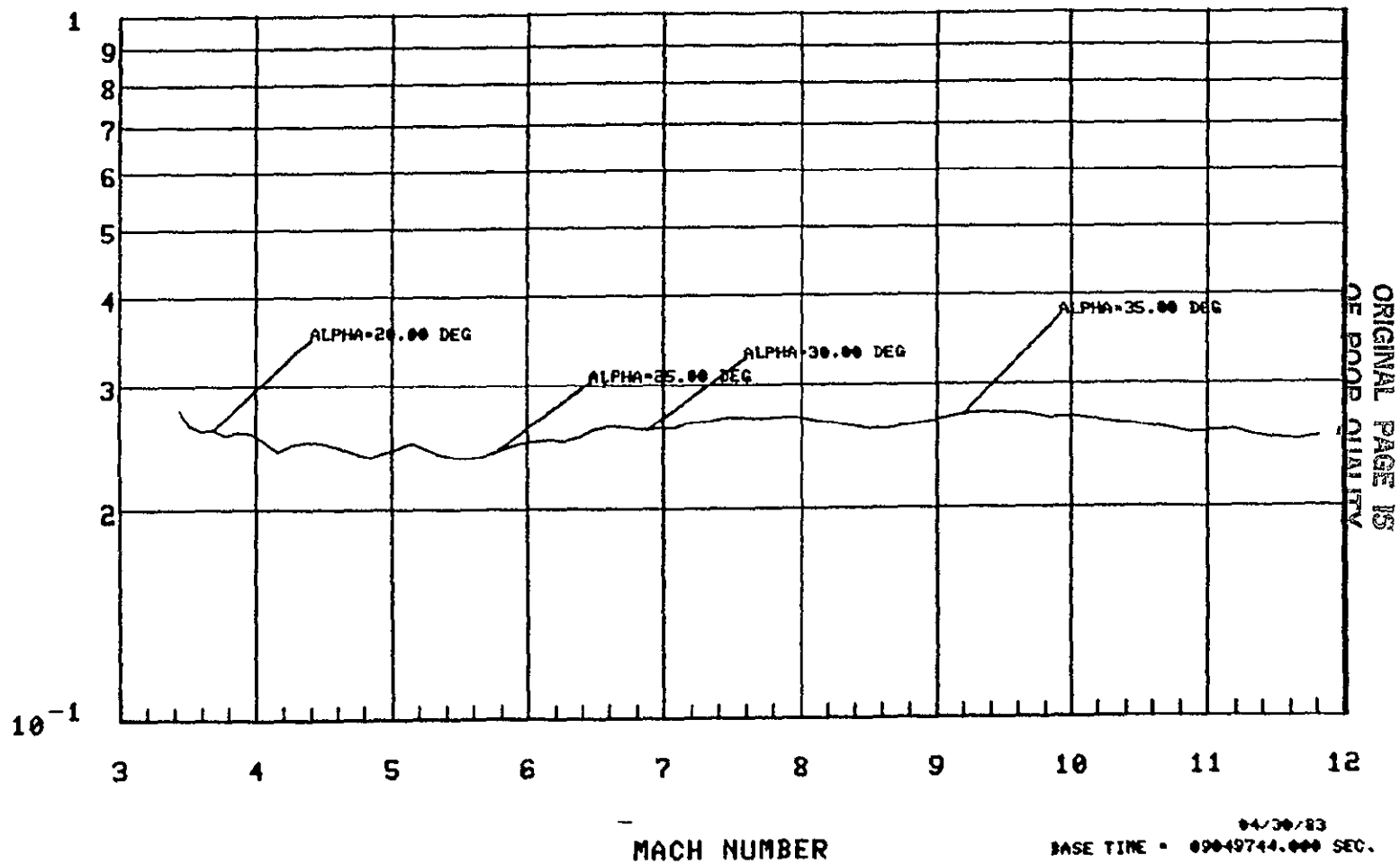
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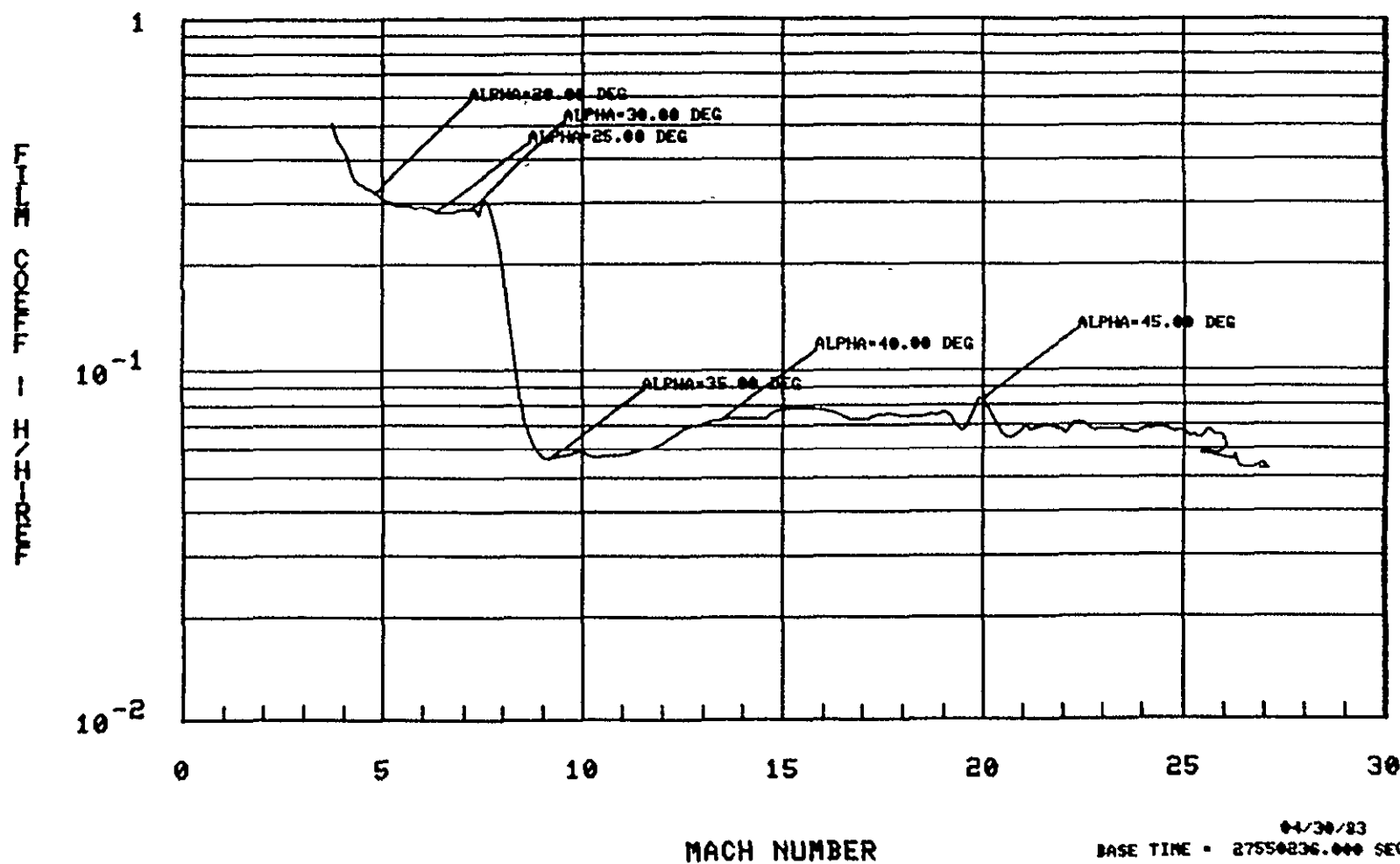
U0779489A/H-REF 1065-1460 SEC



B-337

# STS-2 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

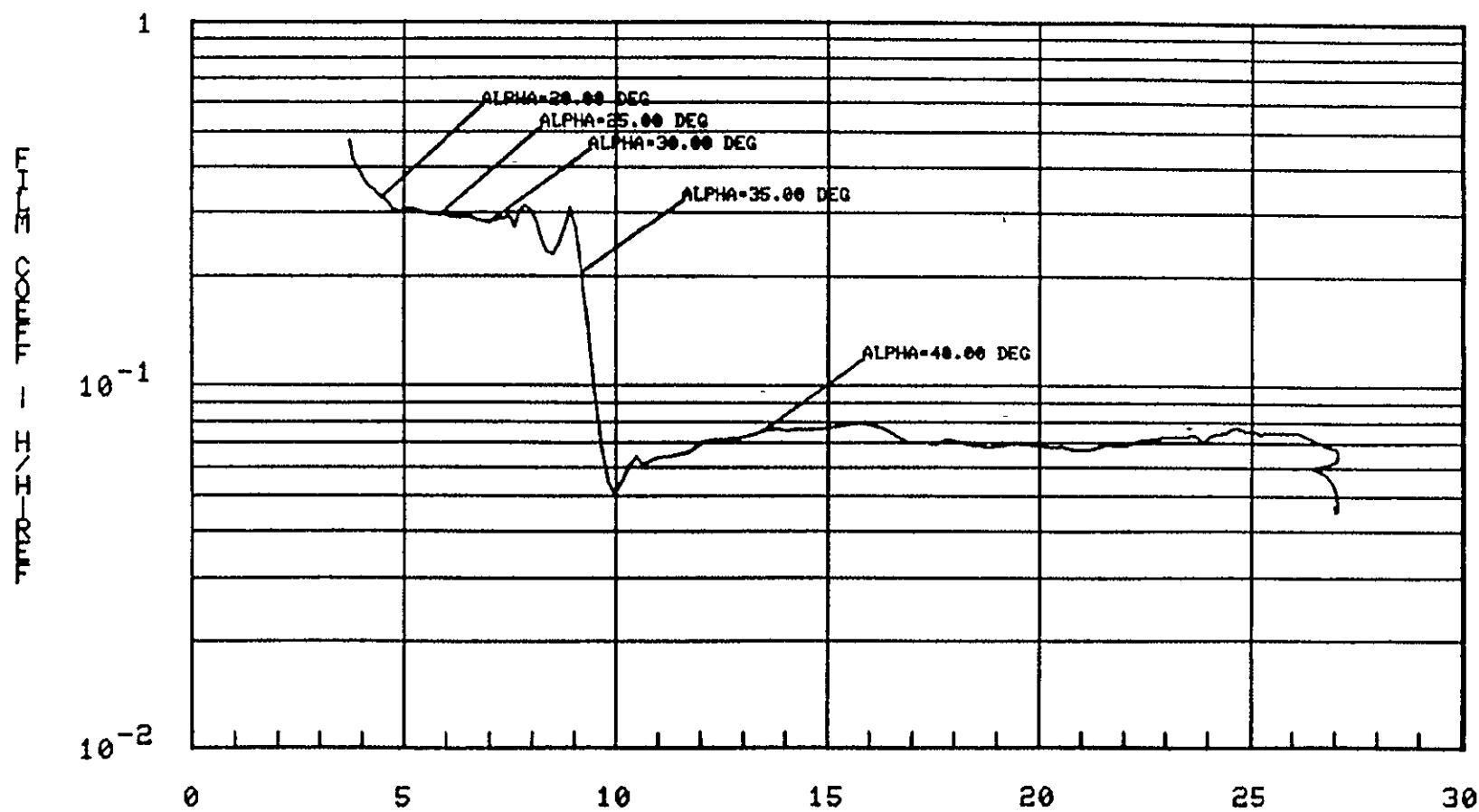
U07T9489A/H-REF 200-1480 SEC



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# ST5-3 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A/H-REF 200-1380 SEC



B-333

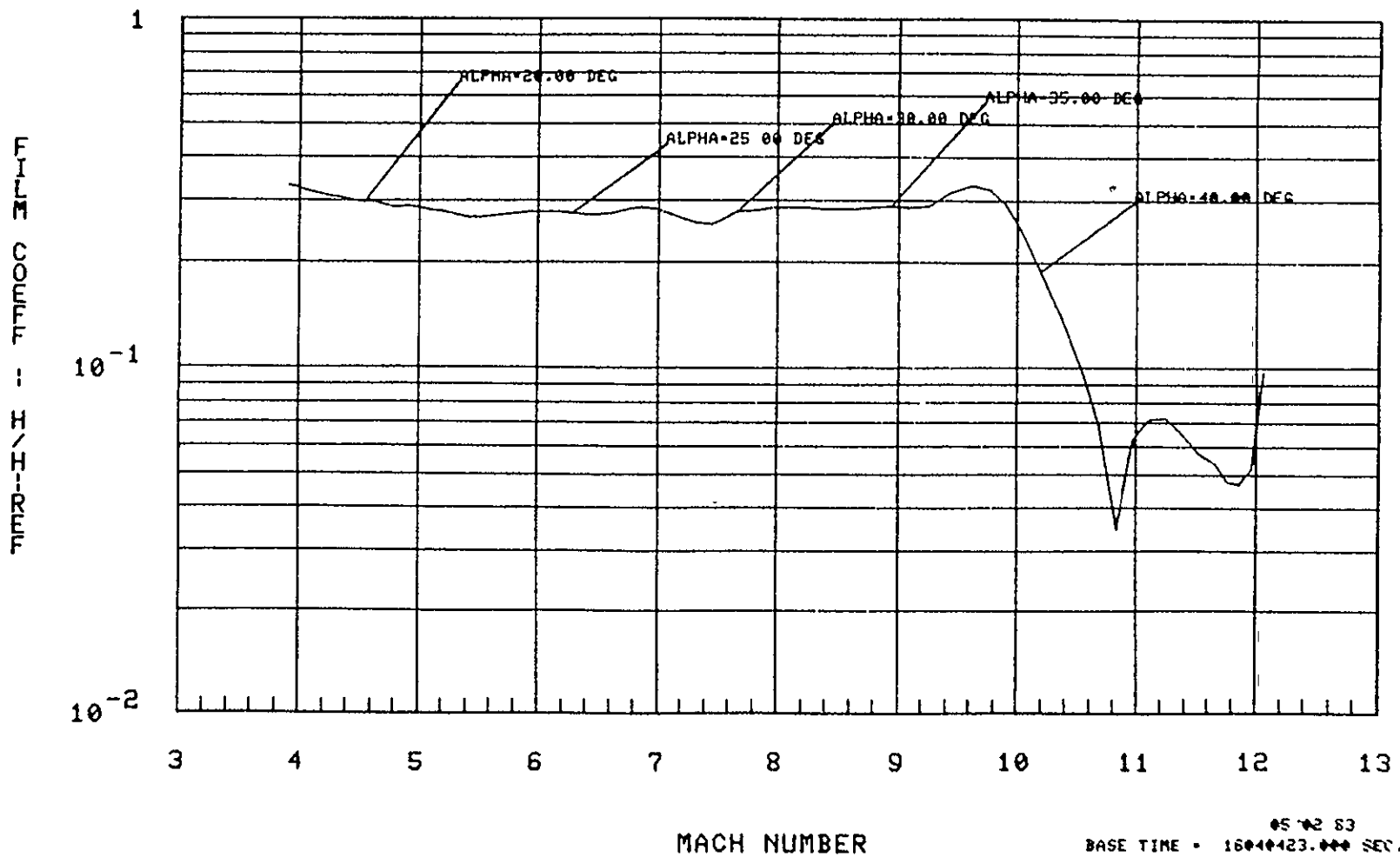
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MACH NUMBER

04/30/83  
BASE TIME = 07745684.000 SEC.

# STS-4 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A/H-PEF 965-1300 SEC

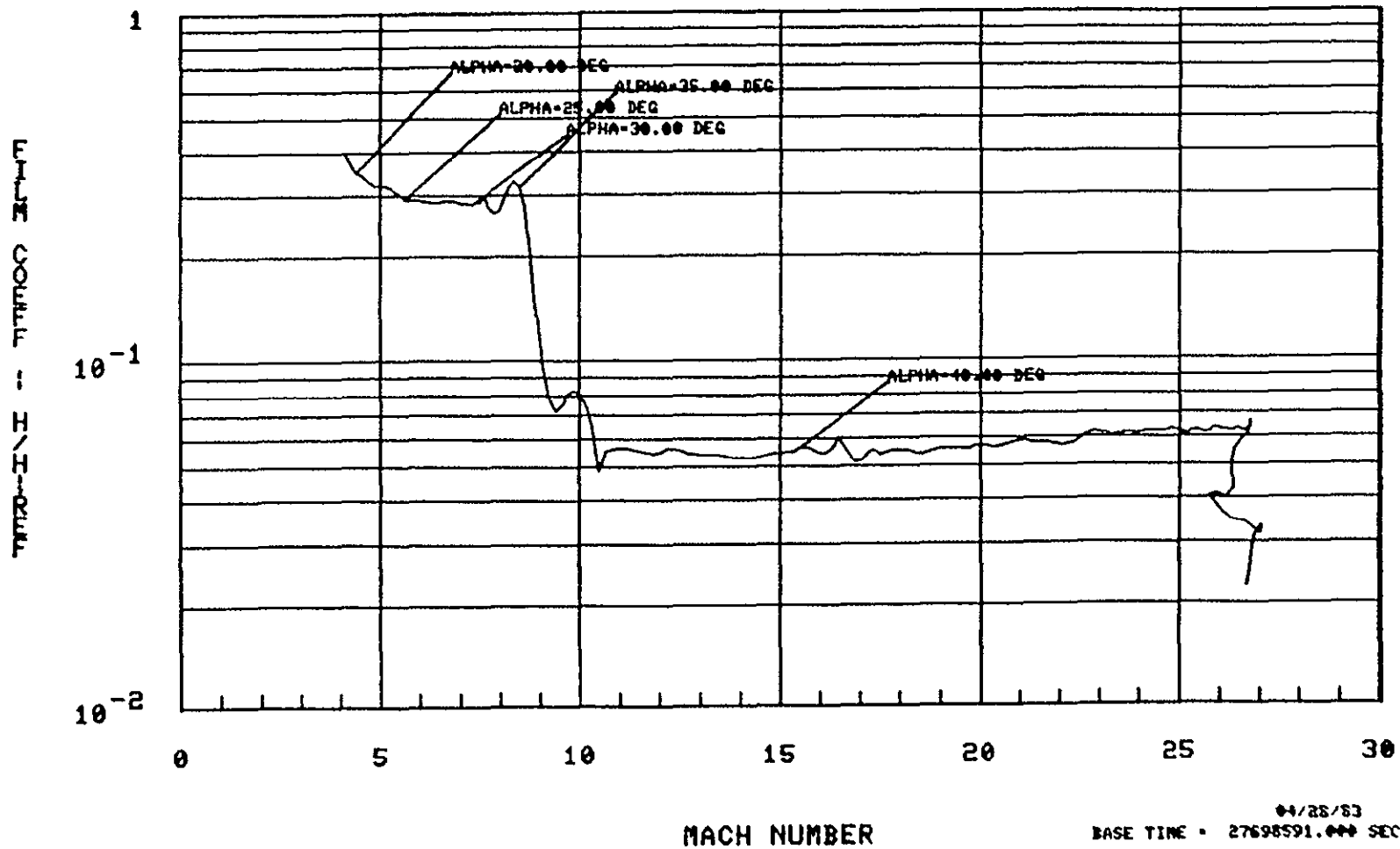


B-334

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# STS-5 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

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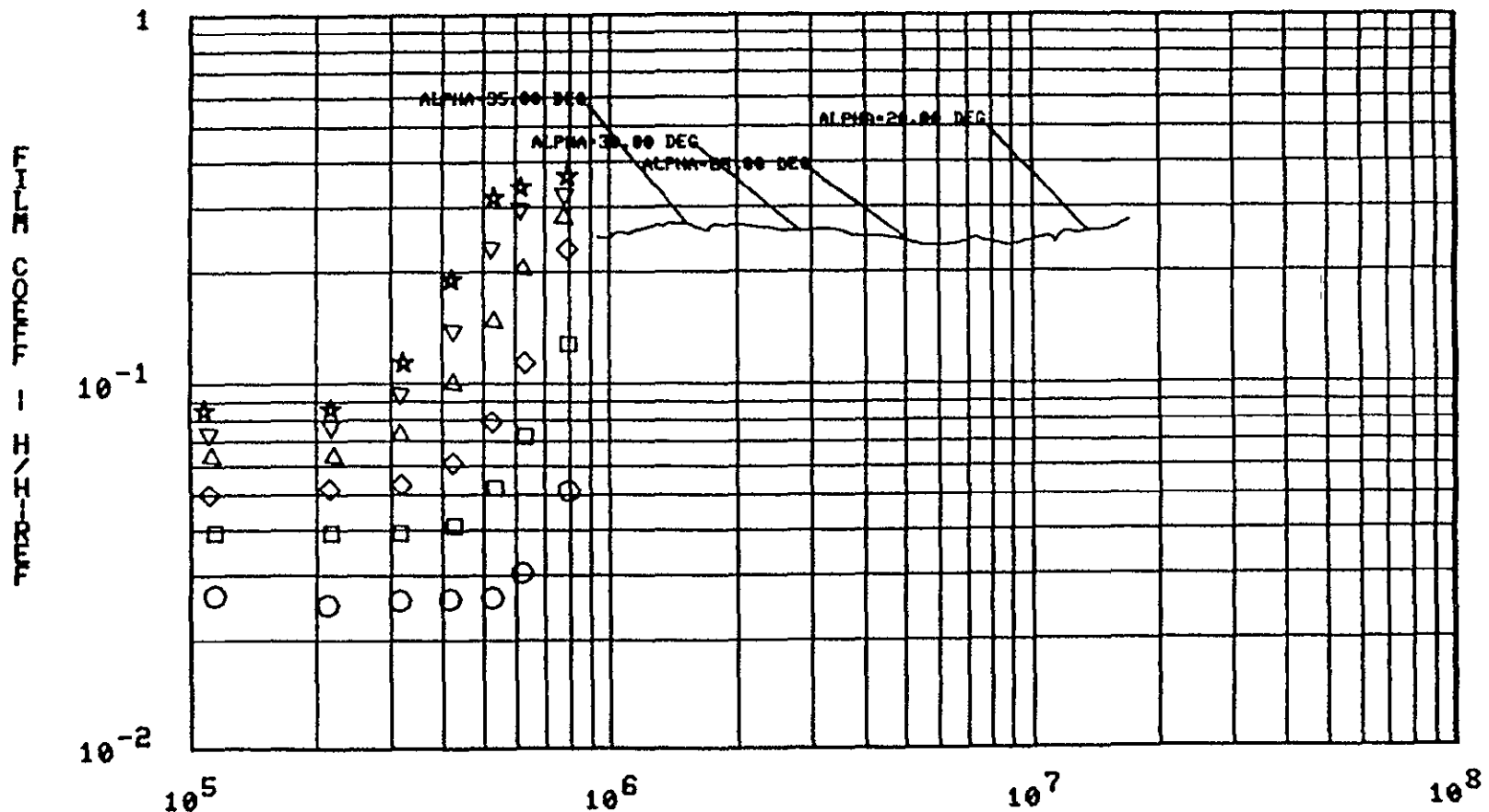


B-335

# STS-1 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○ OH39 ALPHA = 20 DEGREES  
 □ OH39 ALPHA = 25 DEGREES  
 ◇ OH39 ALPHA = 30 DEGREES  
 △ OH39 ALPHA = 35 DEGREES  
 ▽ OH39 ALPHA = 40 DEGREES  
 ★ OH39 ALPHA = 45 DEGREES

U07T9489A/H-REF 1065-1460 SEC



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REYNOLDS NUMBER (NS)

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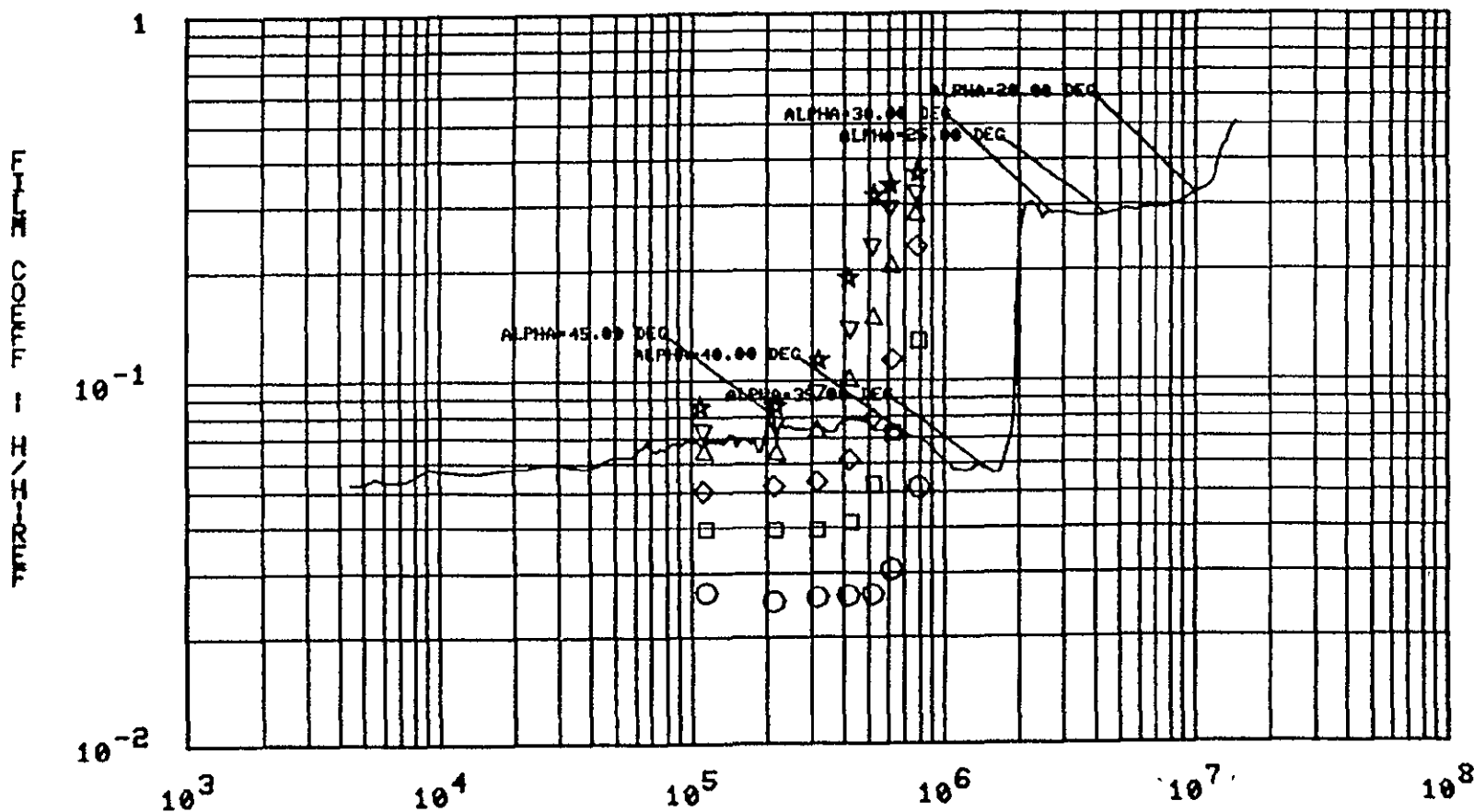


# STS-2 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

0H39 ALPHA = 20 DEGREES  
0H39 ALPHA = 25 DEGREES  
0H39 ALPHA = 30 DEGREES  
0H39 ALPHA = 35 DEGREES  
0H39 ALPHA = 40 DEGREES  
0H39 ALPHA = 45 DEGREES

U07T9489A/H-REF 200-1480 SEC



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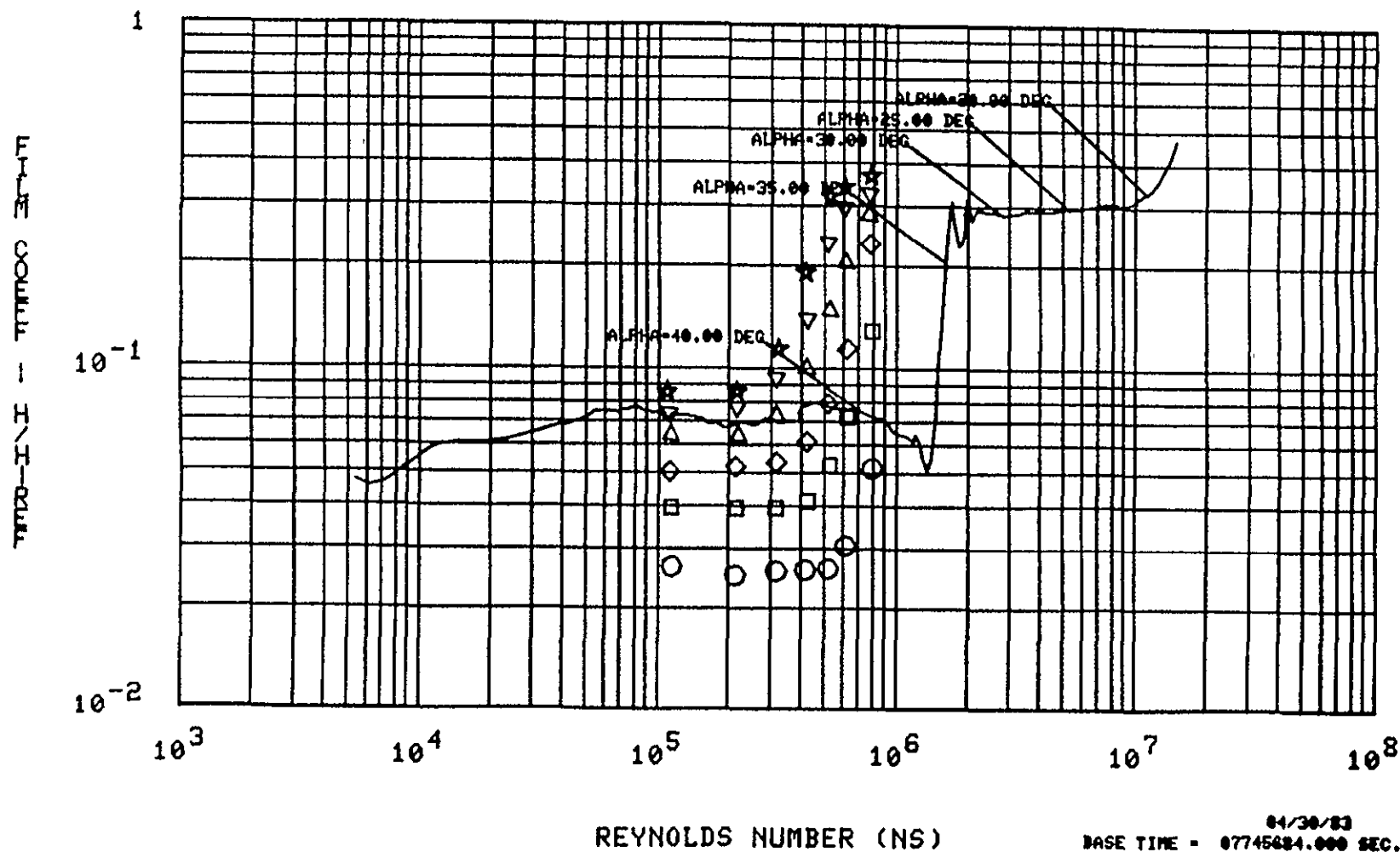
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# STS-3 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISON

○ OH39 ALPHA = 20 DEGREES  
 □ OH39 ALPHA = 25 DEGREES  
 ◇ OH39 ALPHA = 30 DEGREES  
 △ OH39 ALPHA = 35 DEGREES  
 ▽ OH39 ALPHA = 40 DEGREES  
 ☆ OH39 ALPHA = 45 DEGREES

U07T9489A/H-REF 200-1380 SEC



B-338

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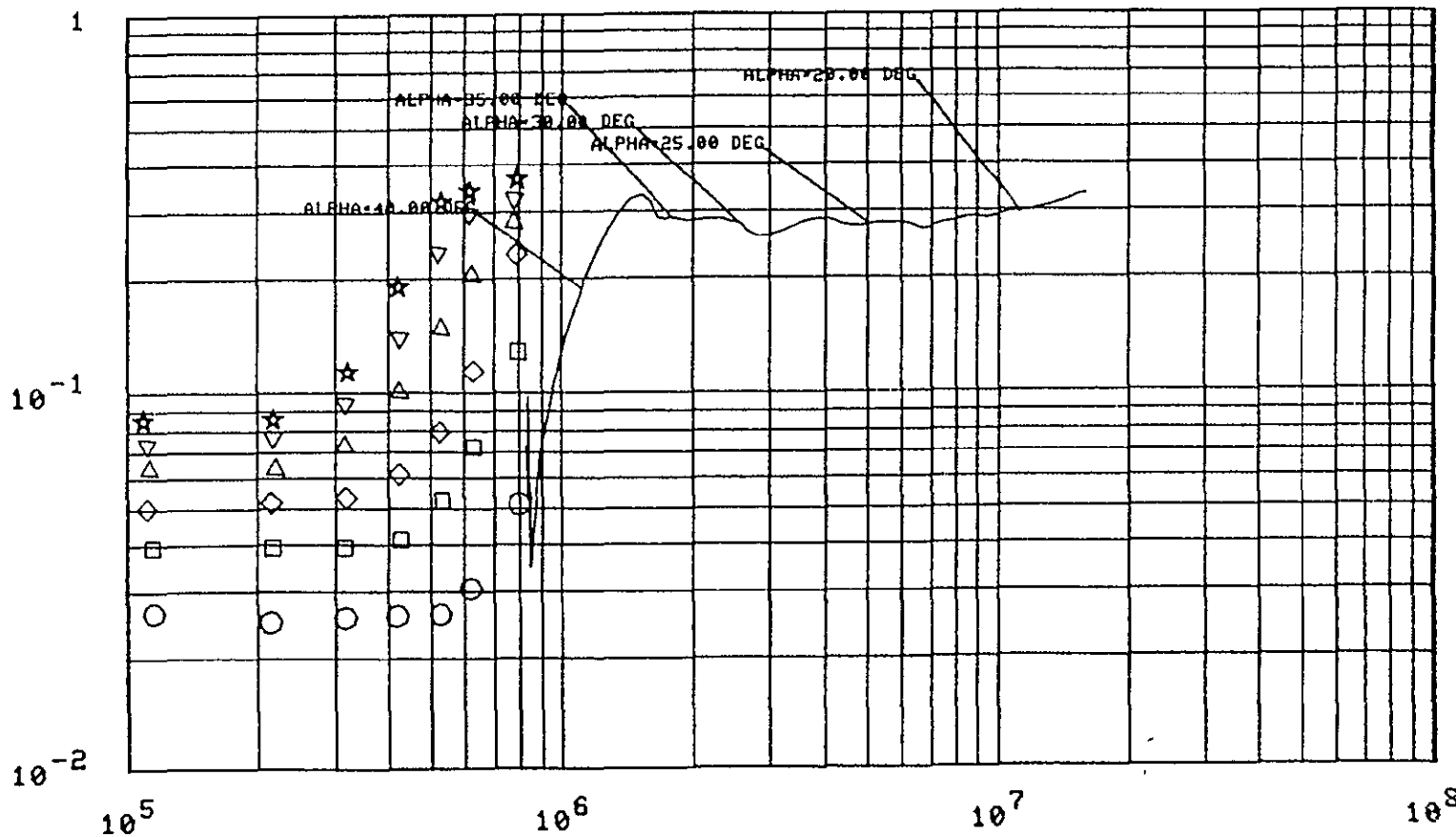
# STS-4 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

U07T9489A/H-REF 965-1300 SEC

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REYNOLDS NUMBER (NS)

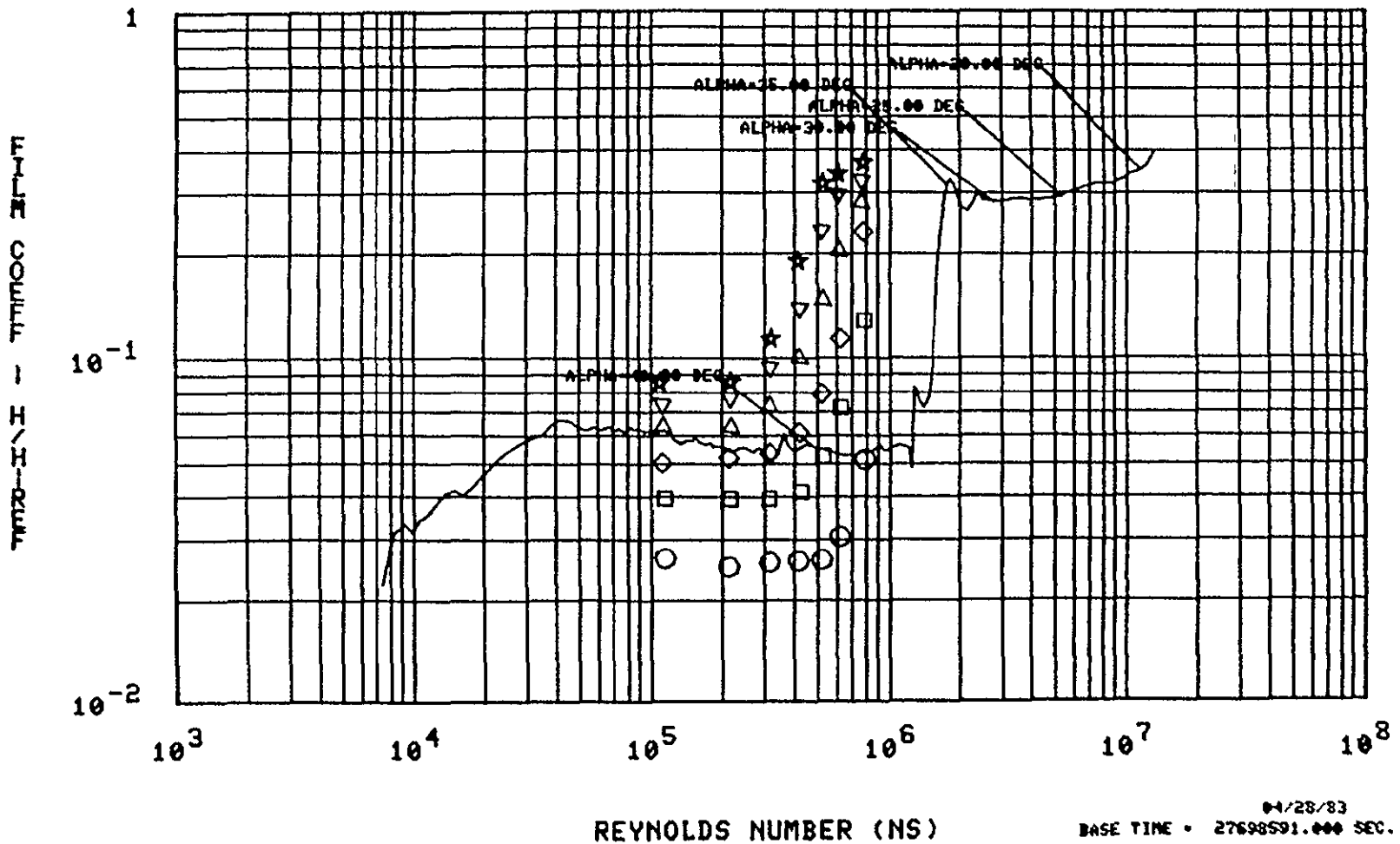
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# STS-5 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

○  
□  
△  
▽  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

U07T9489A/H-REF 150-1350 SEC

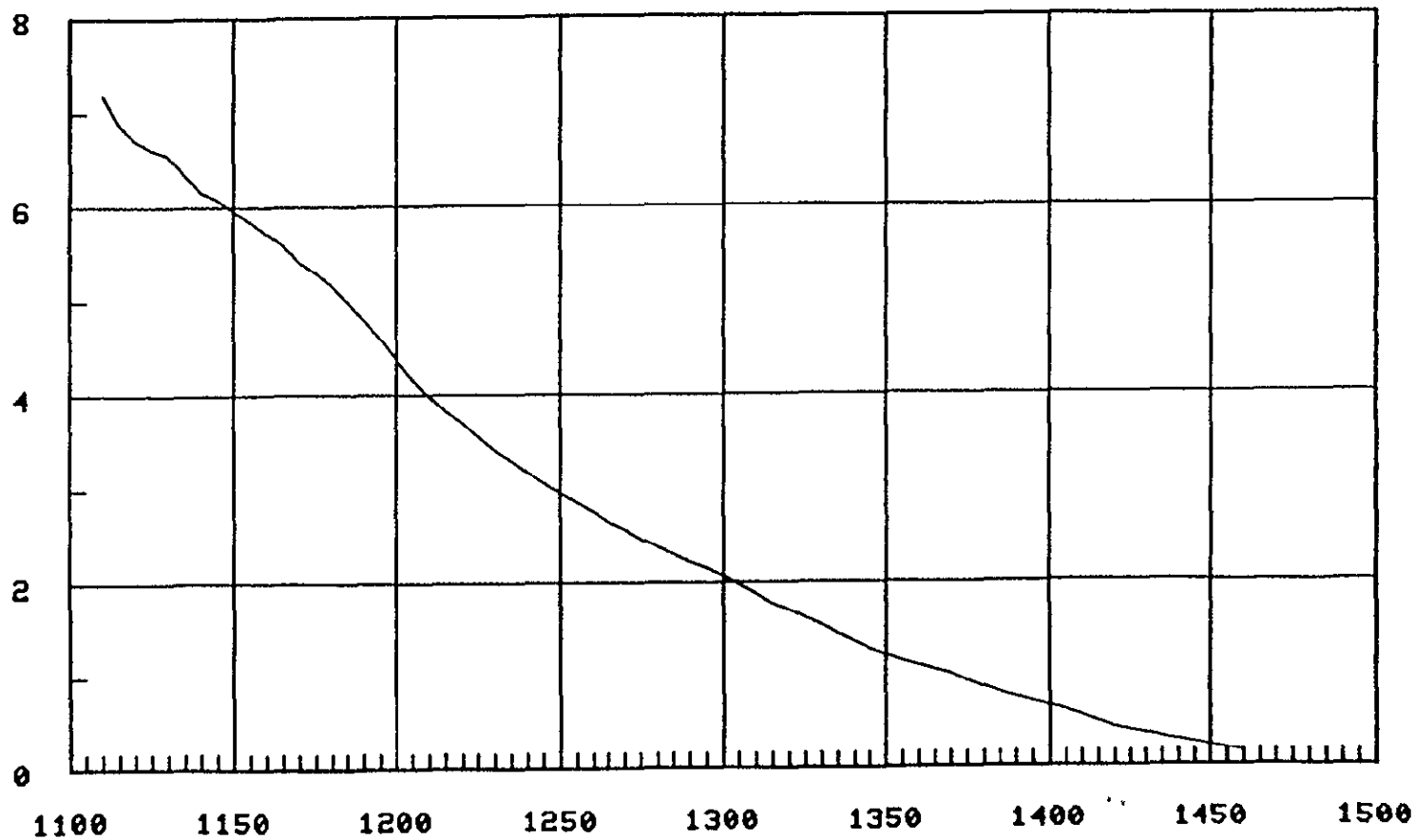


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# STS-1 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A

FLIGHTING ACFT - B-70/ELMCO - SWS



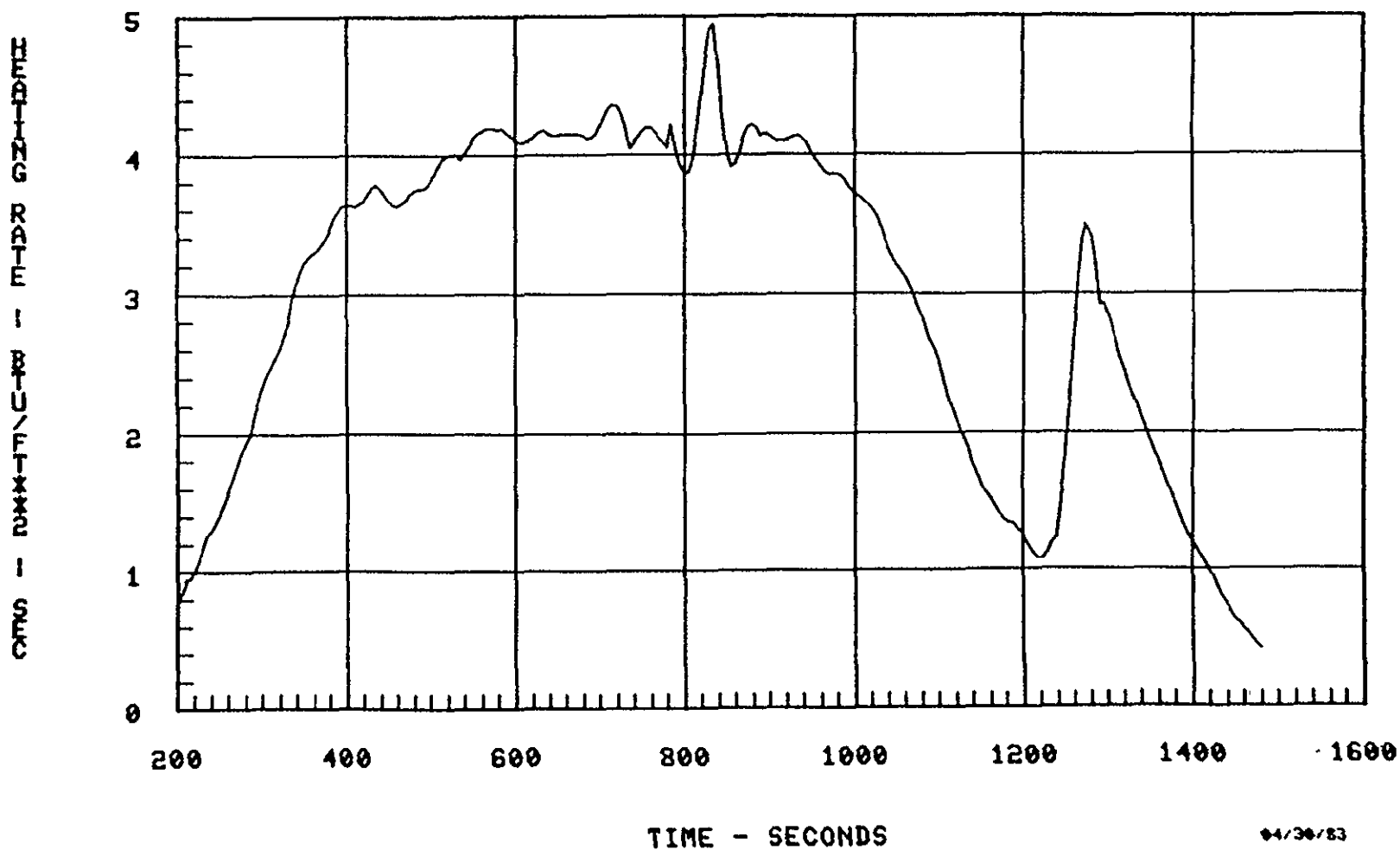
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TIME - SECONDS

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A



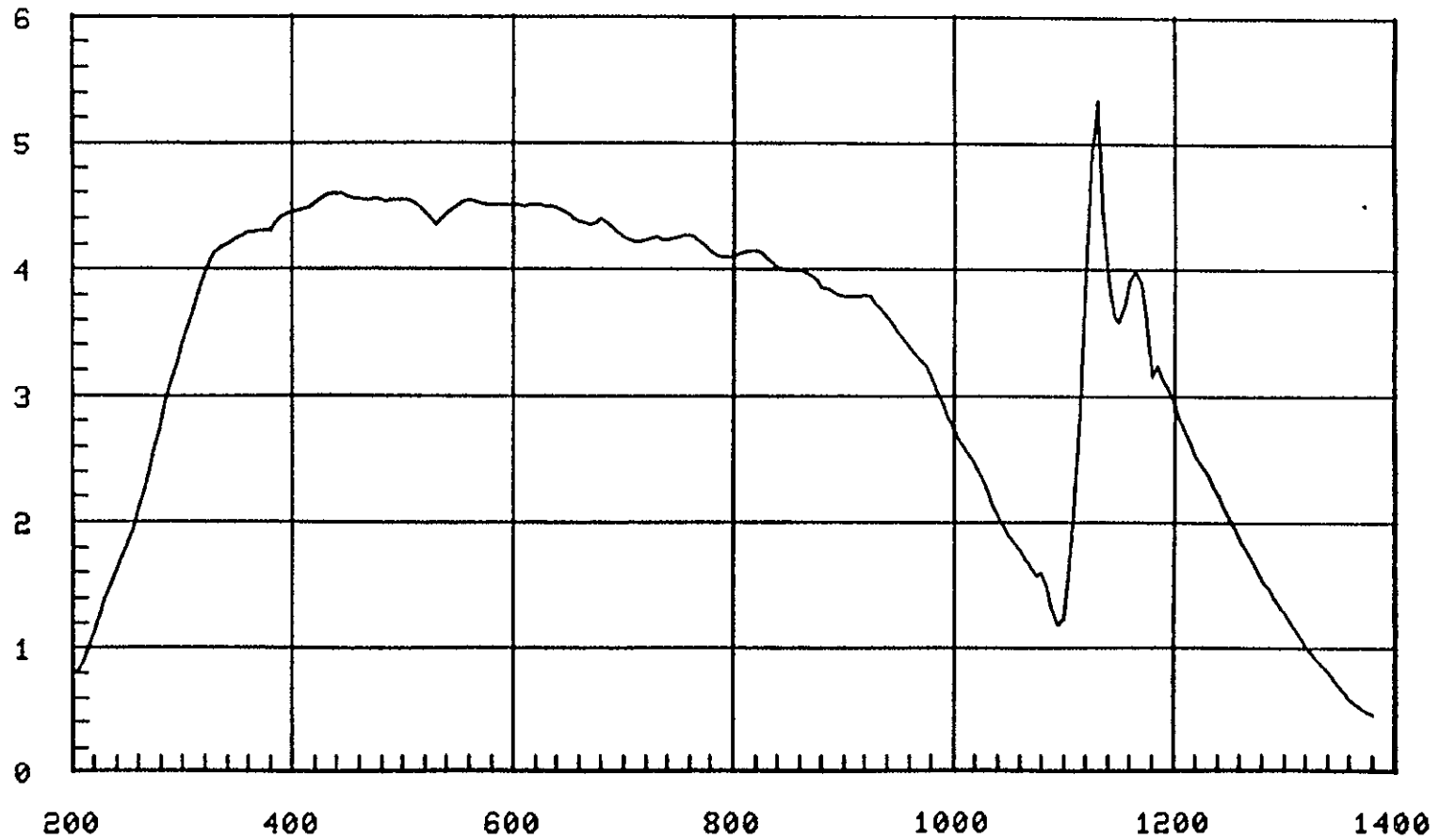
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04/30/83

# STS-3 (107 FT LENGTH CL $X/L=0.90$ ) FLIGHT PARAMETER COMPARISO

U07T9489A

INSTRUMENT - ACCELERATION - GALS



TIME - SECONDS

04/30/83

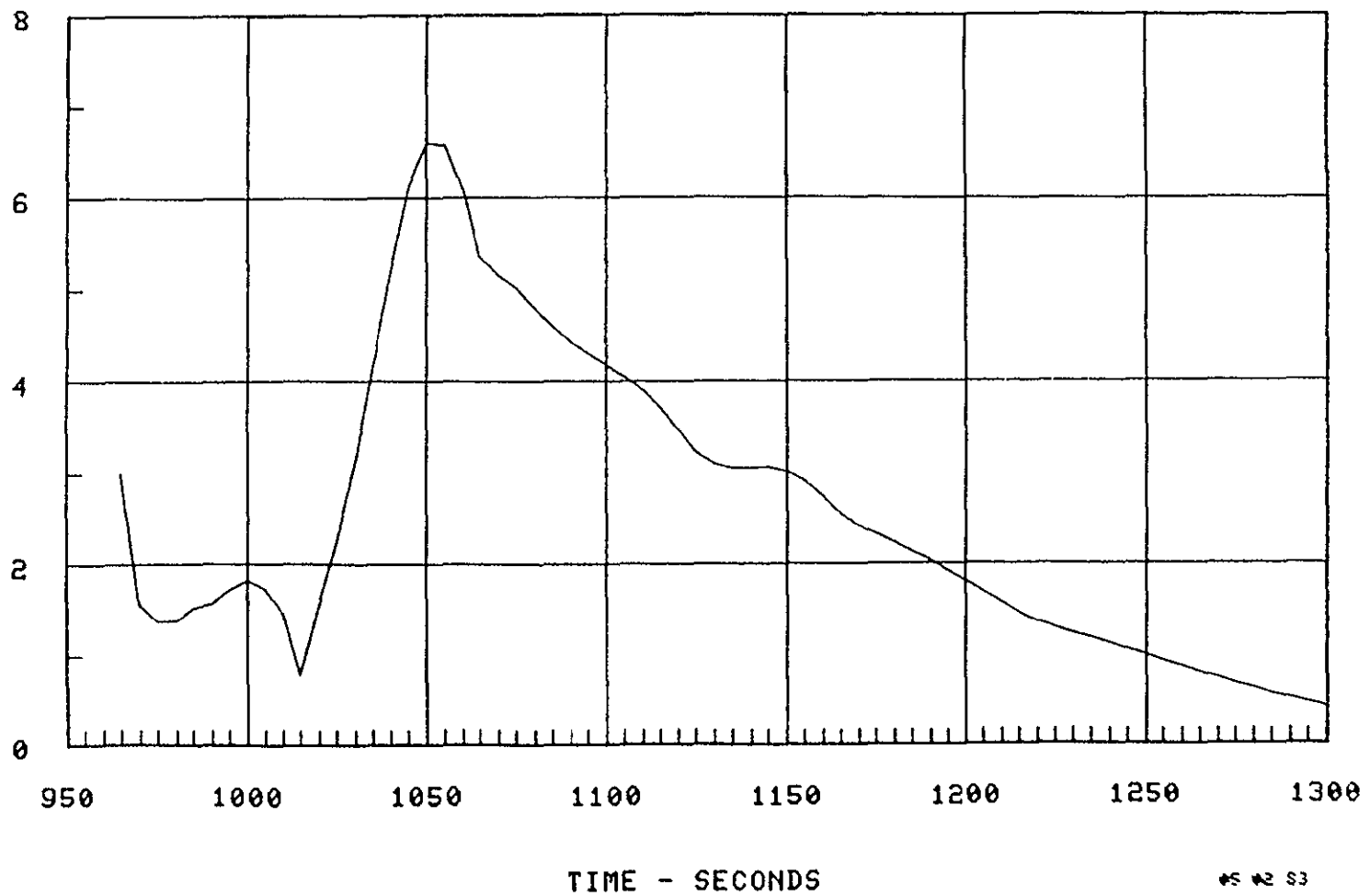
B-343

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# STS-4 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A

FEELING REF - BLOW-UP - SMC



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B-344

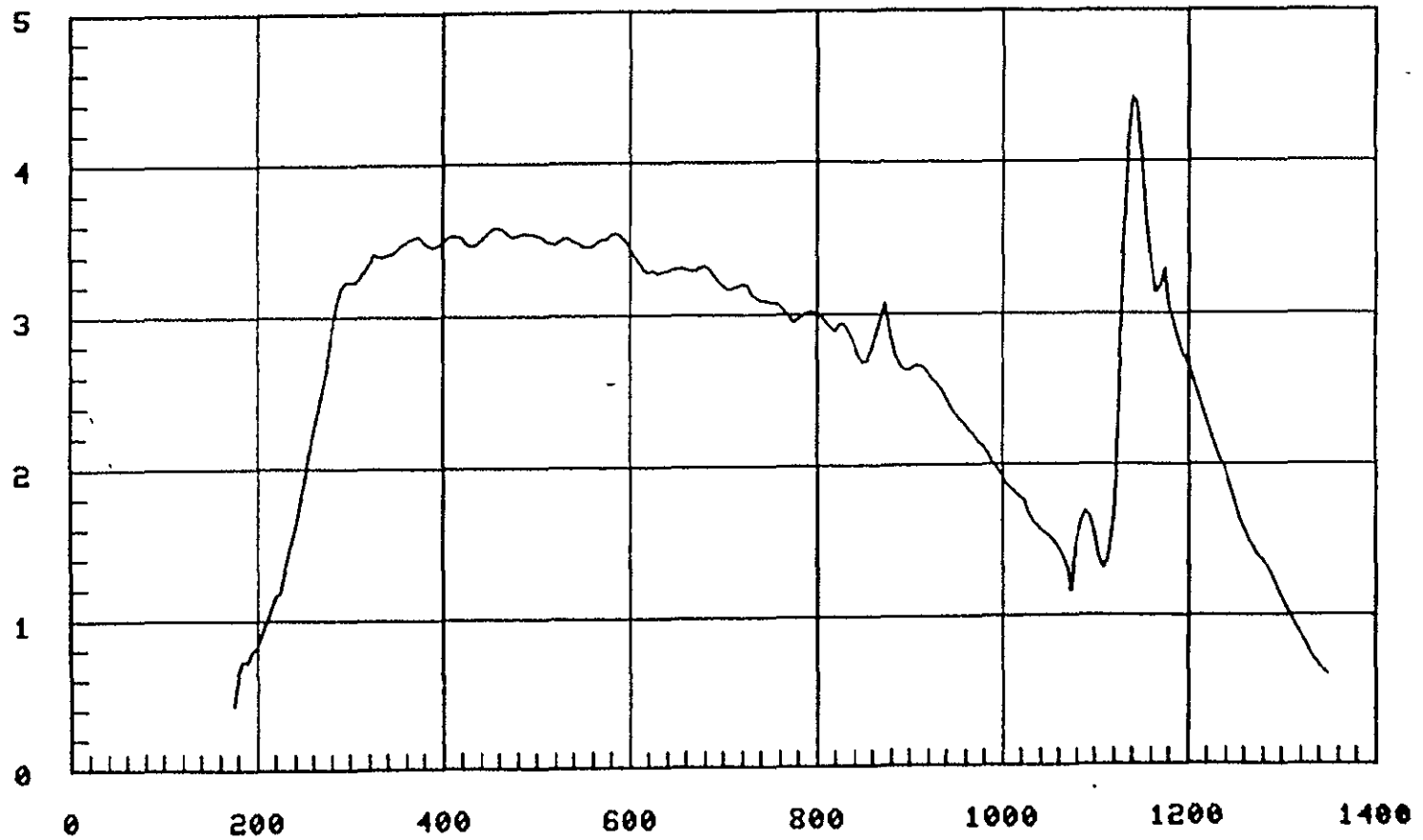
\*S \*2 S3



# STS-5 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A

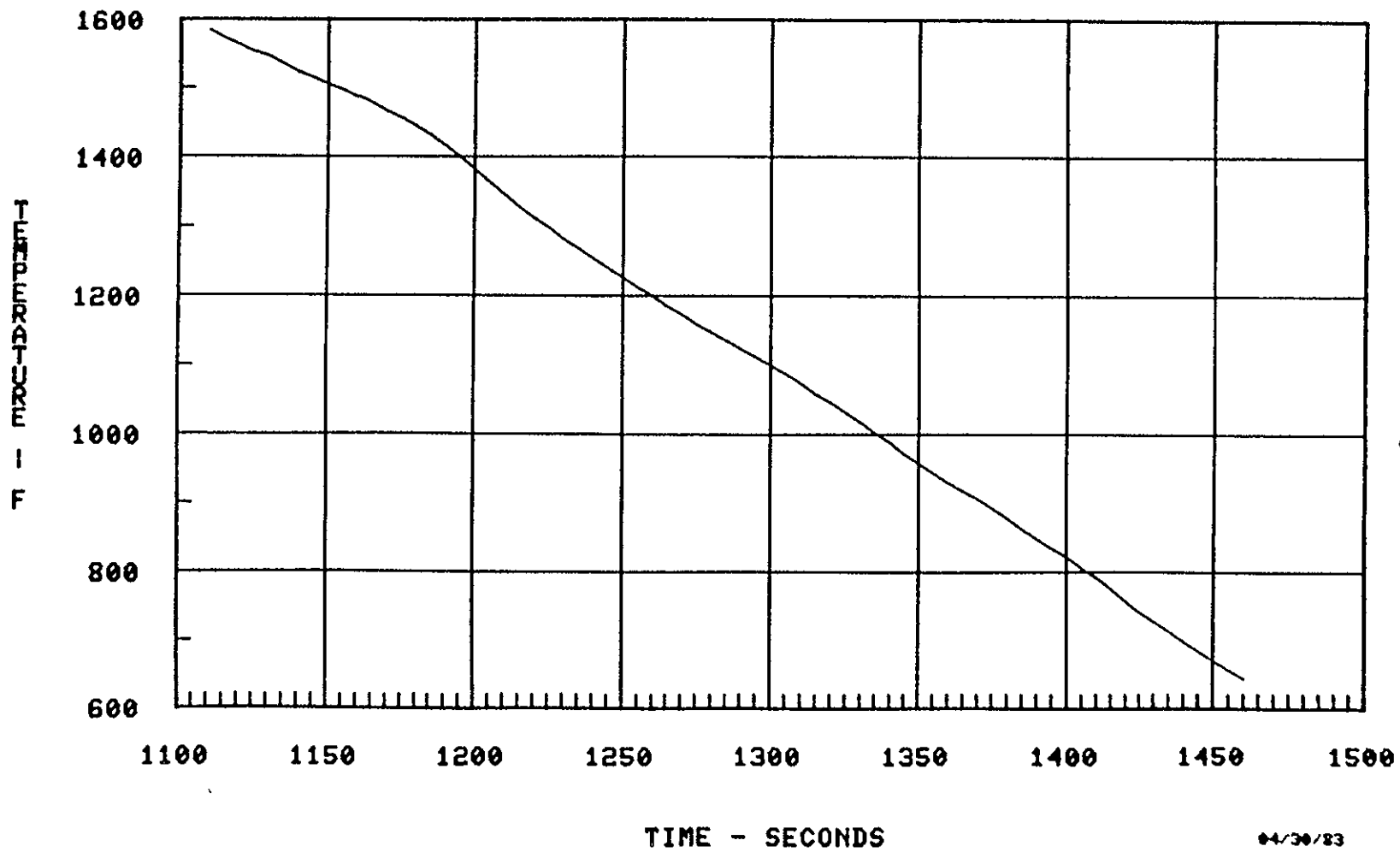
INDICATED ACCEL - ALTITUDE - GALS



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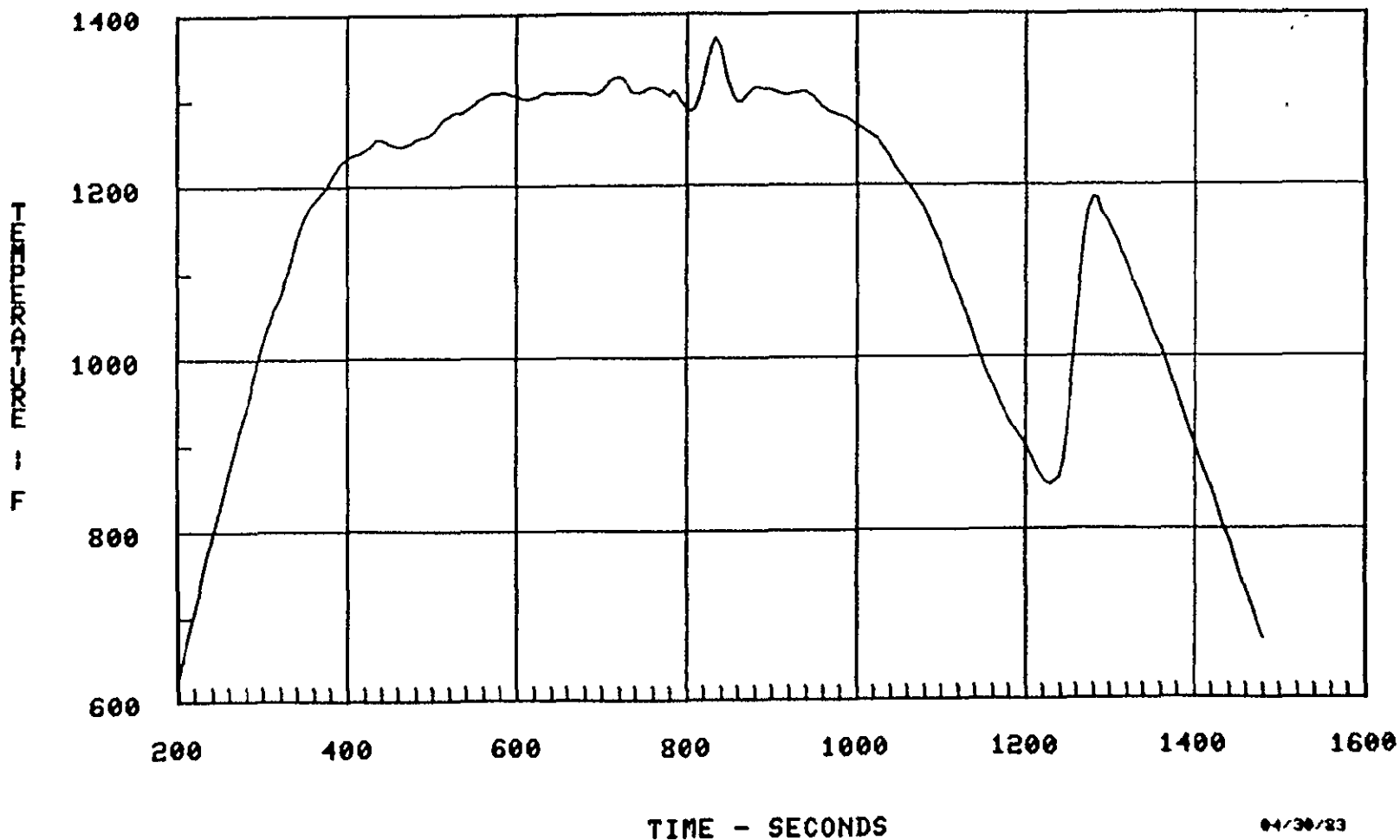
# STS-1 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U87T9489A



# STS-2 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A



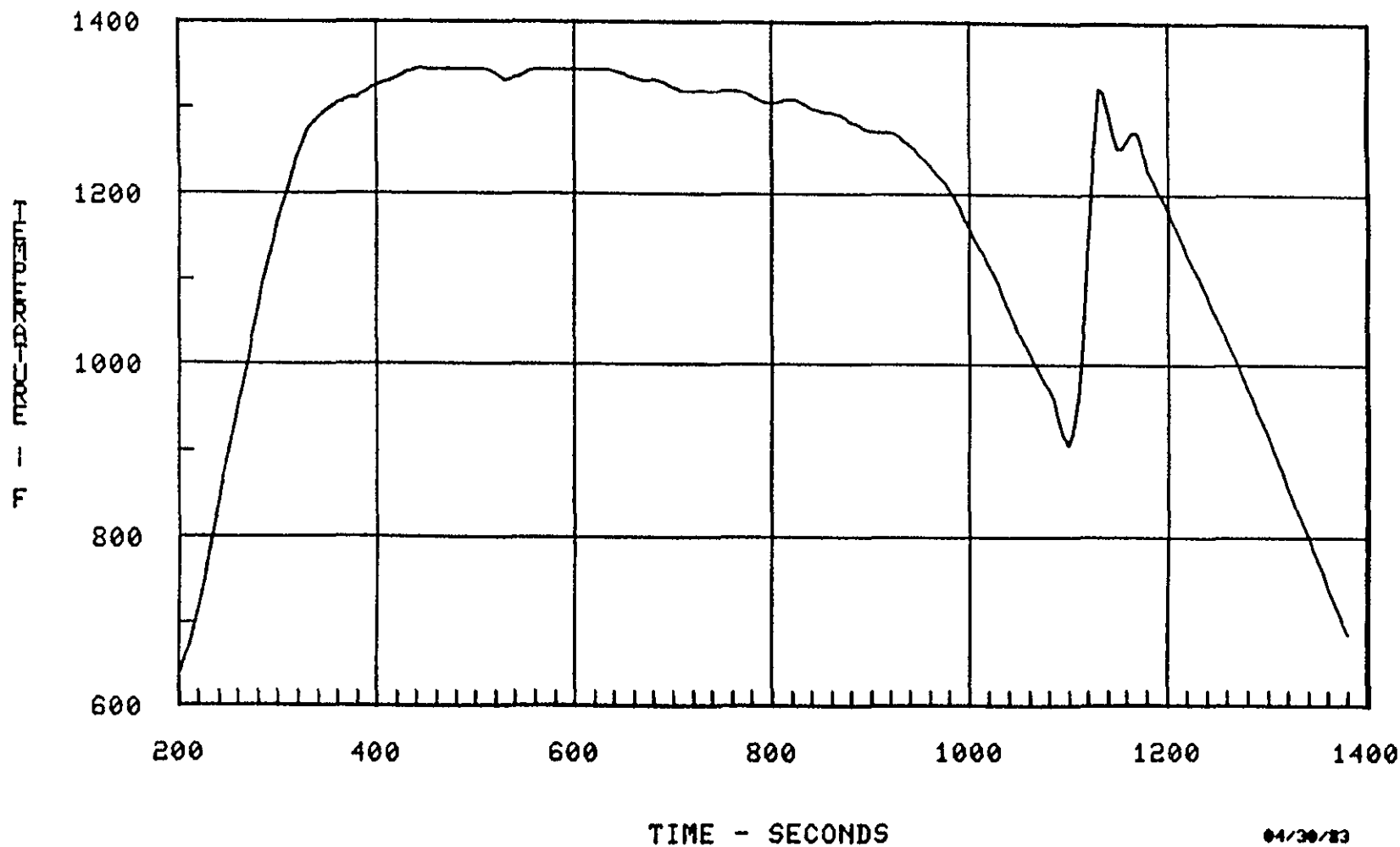
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B-347

04/30/83

# STS-3 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

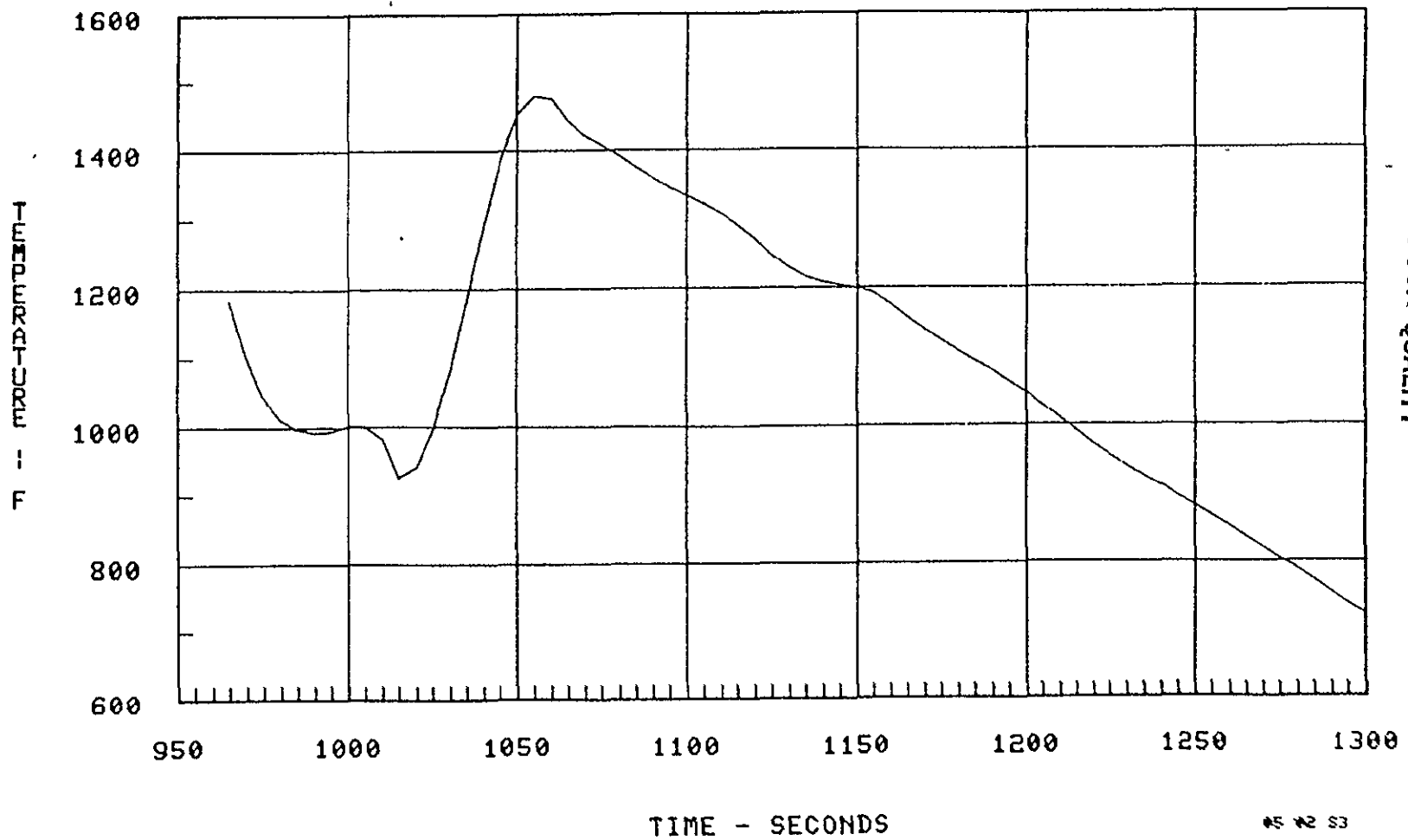
U07T9489A



B-348

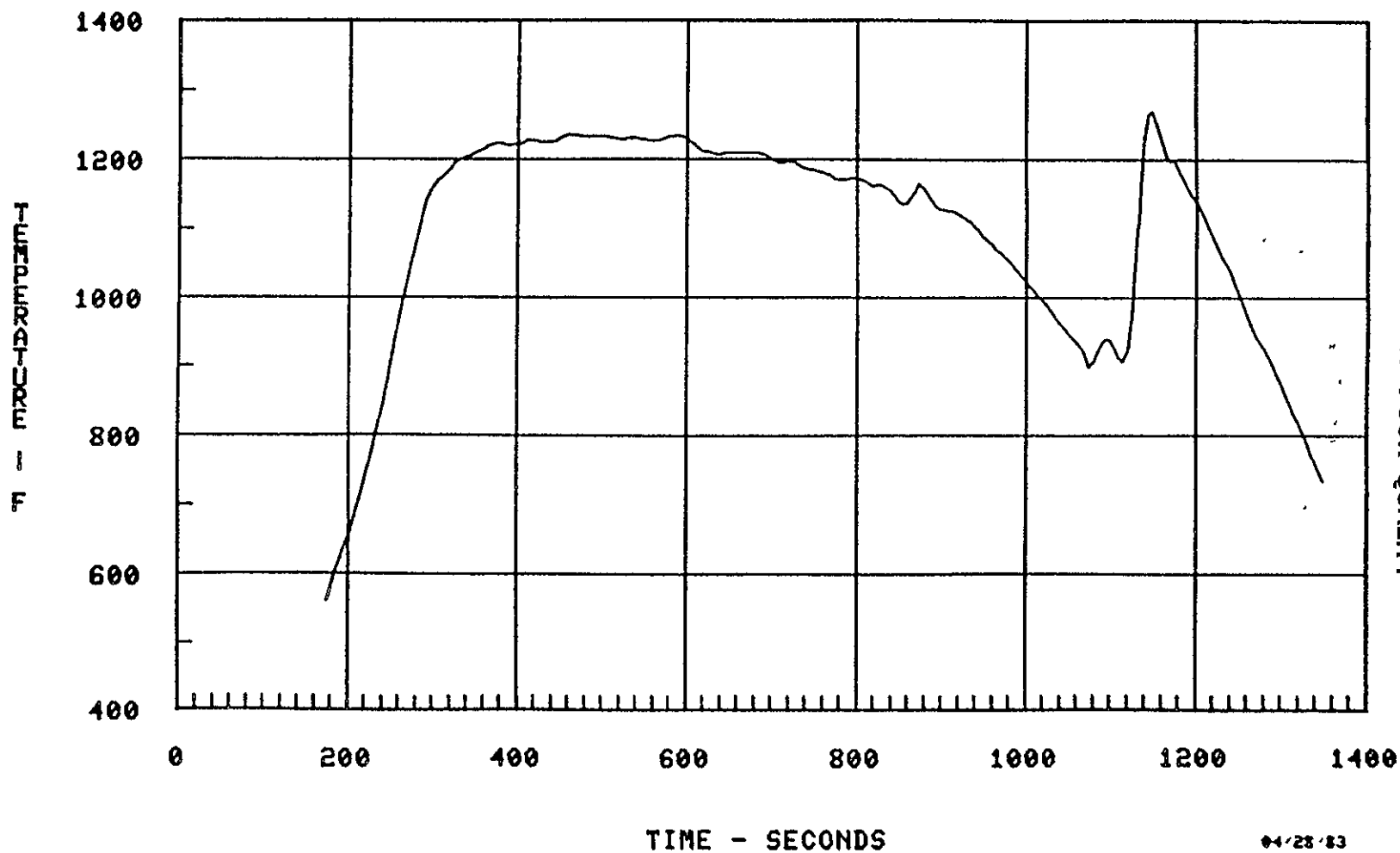
# STS-4 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISON

U07T9489A



# STS-5 (107 FT LENGTH CL X/L=0.90) FLIGHT PARAMETER COMPARISO

U07T9489A



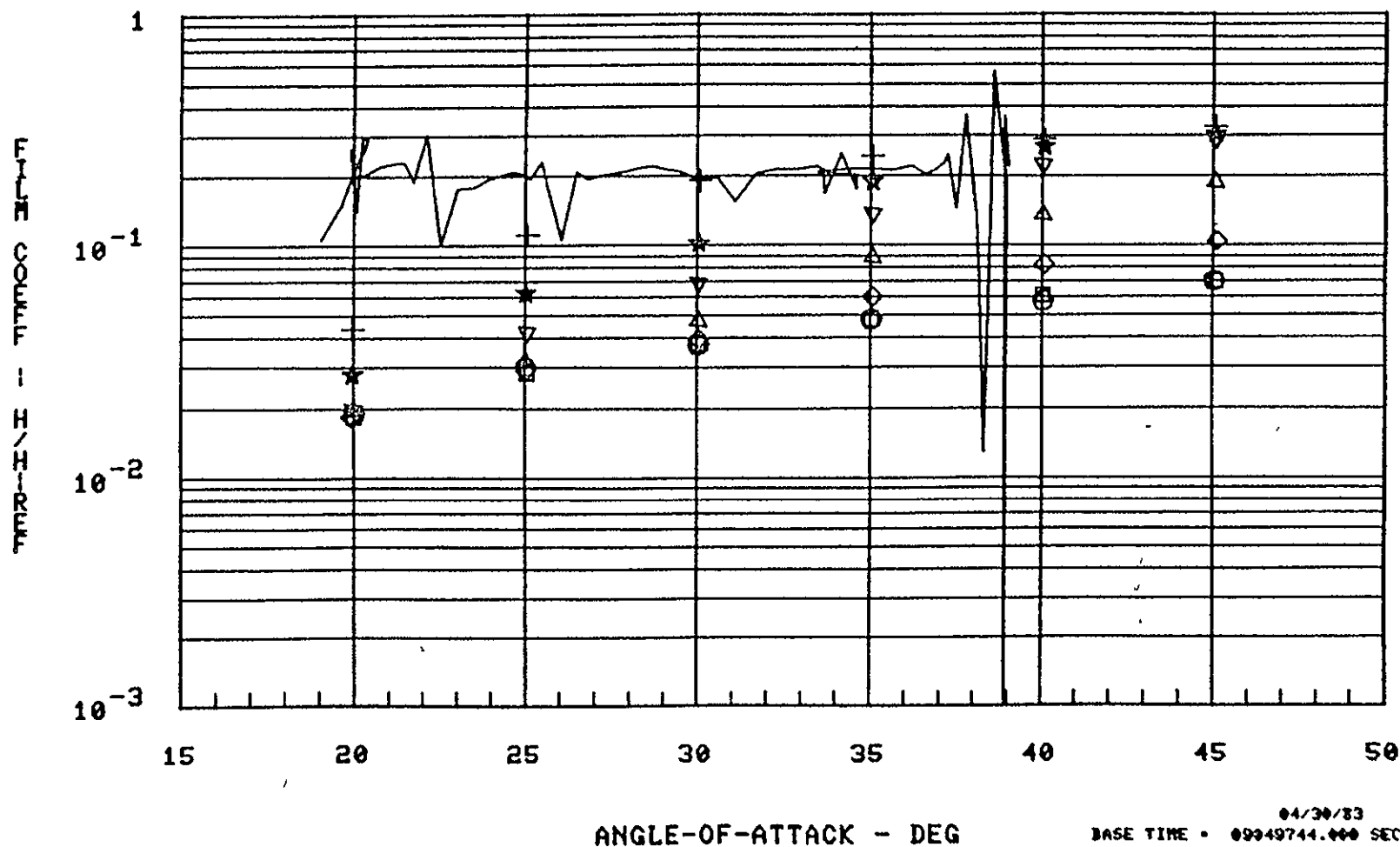
B-350

# STS-1 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9751A/H-REF 1065-1460 SEC



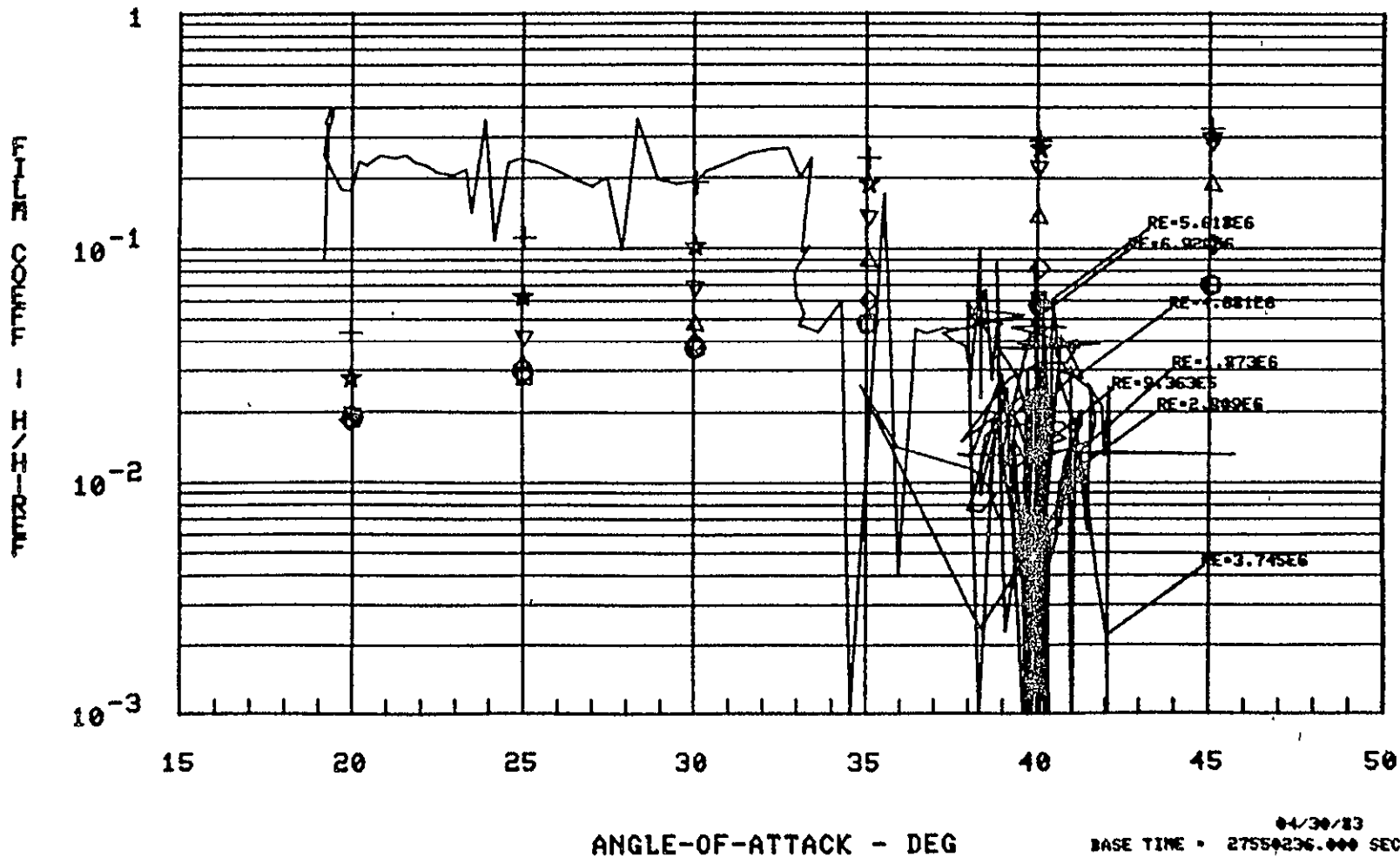
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# STS-2 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9751A/H-REF 200-1480 SEC



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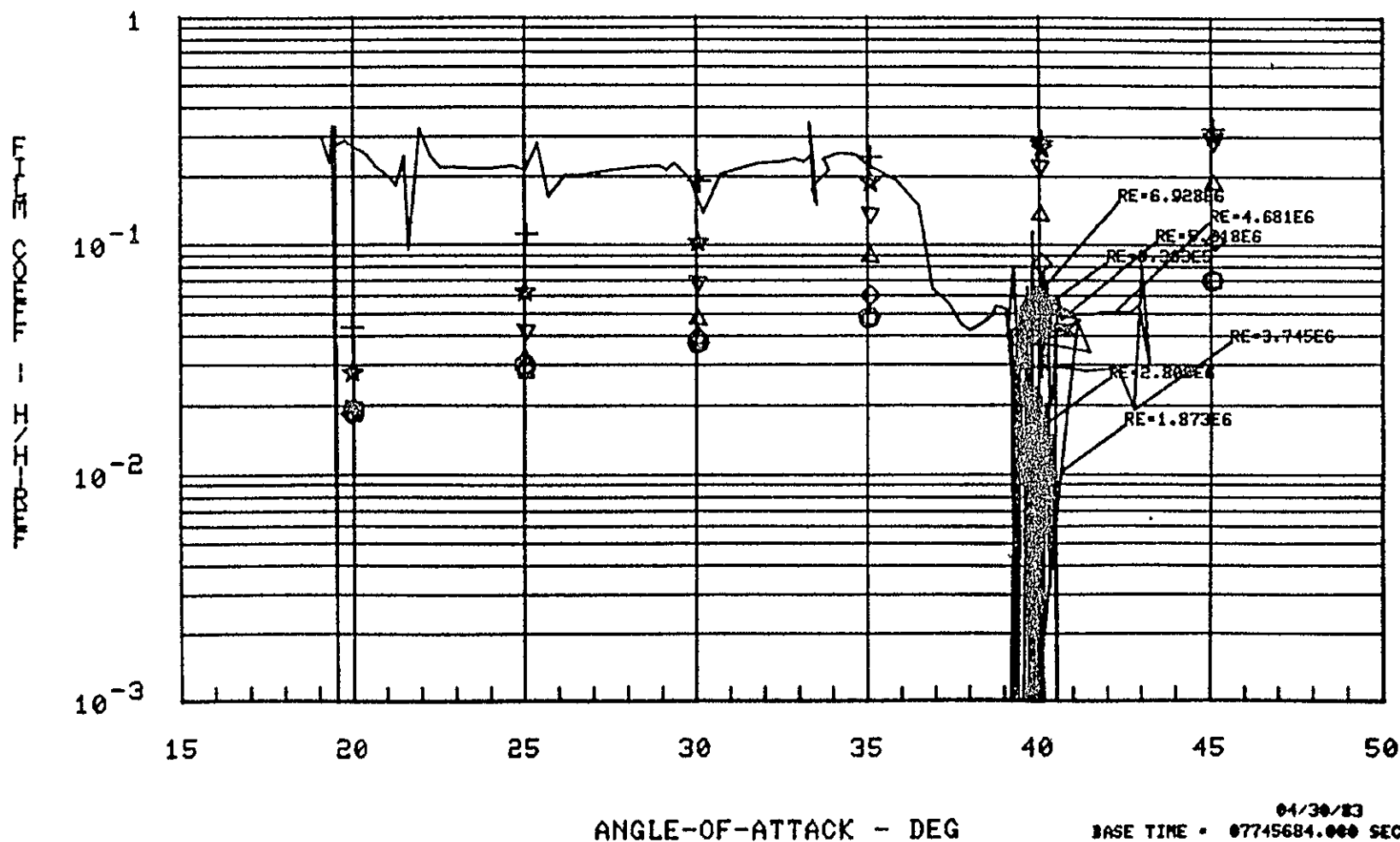


# STS-3 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
□  
△  
▽  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9751A/H-REF 200-1380 SEC



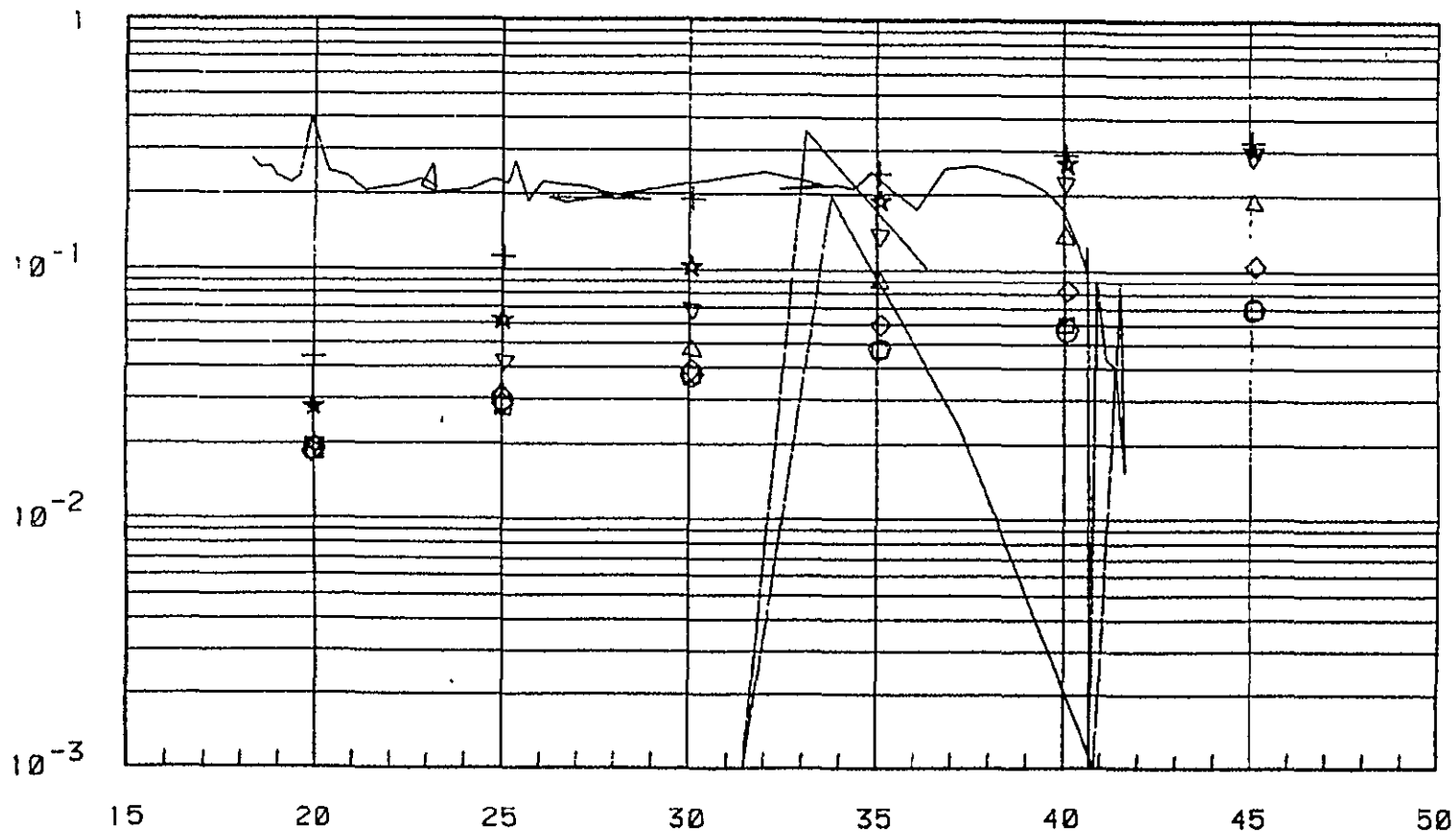
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# STS-4 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

———— V80T0751A/H-REF 065-1300 SEC



ANGLE-OF-ATTACK - DEG

05/02/83  
BASE TIME = 16040423.000 SEC.

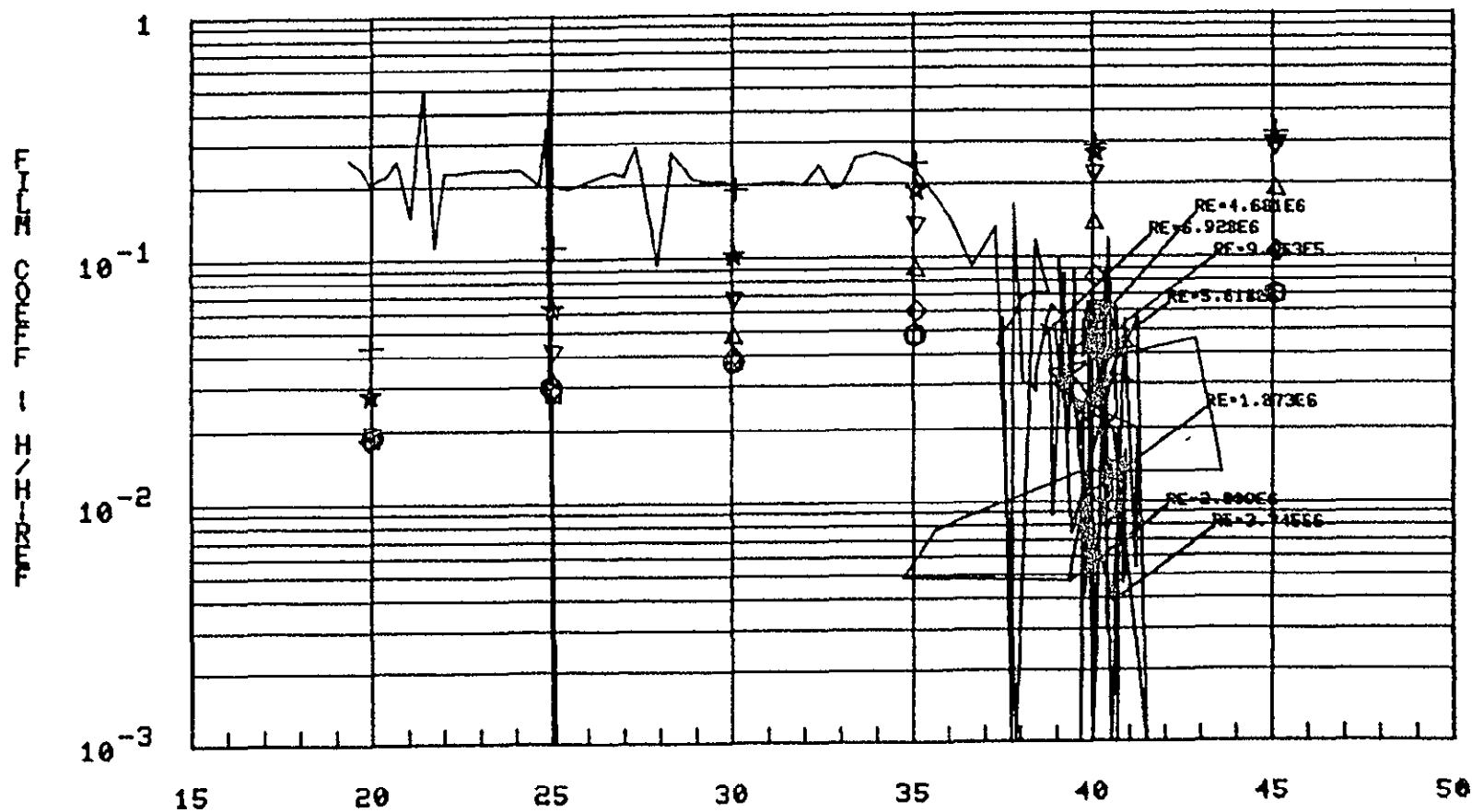
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# STS-5 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

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◇  
△  
★  
+

OH49 0.0175 SCALE RE = 0.5 E06  
OH49 0.0175 SCALE RE = 1.0 E06  
OH49 0.0175 SCALE RE = 1.5 E06  
OH49 0.0175 SCALE RE = 2.0 E06  
OH49 0.0175 SCALE RE = 2.5 E06  
OH49 0.0175 SCALE RE = 3.0 E06  
OH49 0.0175 SCALE RE = 3.7 E06

U09T9751A/H-REF 150-1350 SEC



B-355

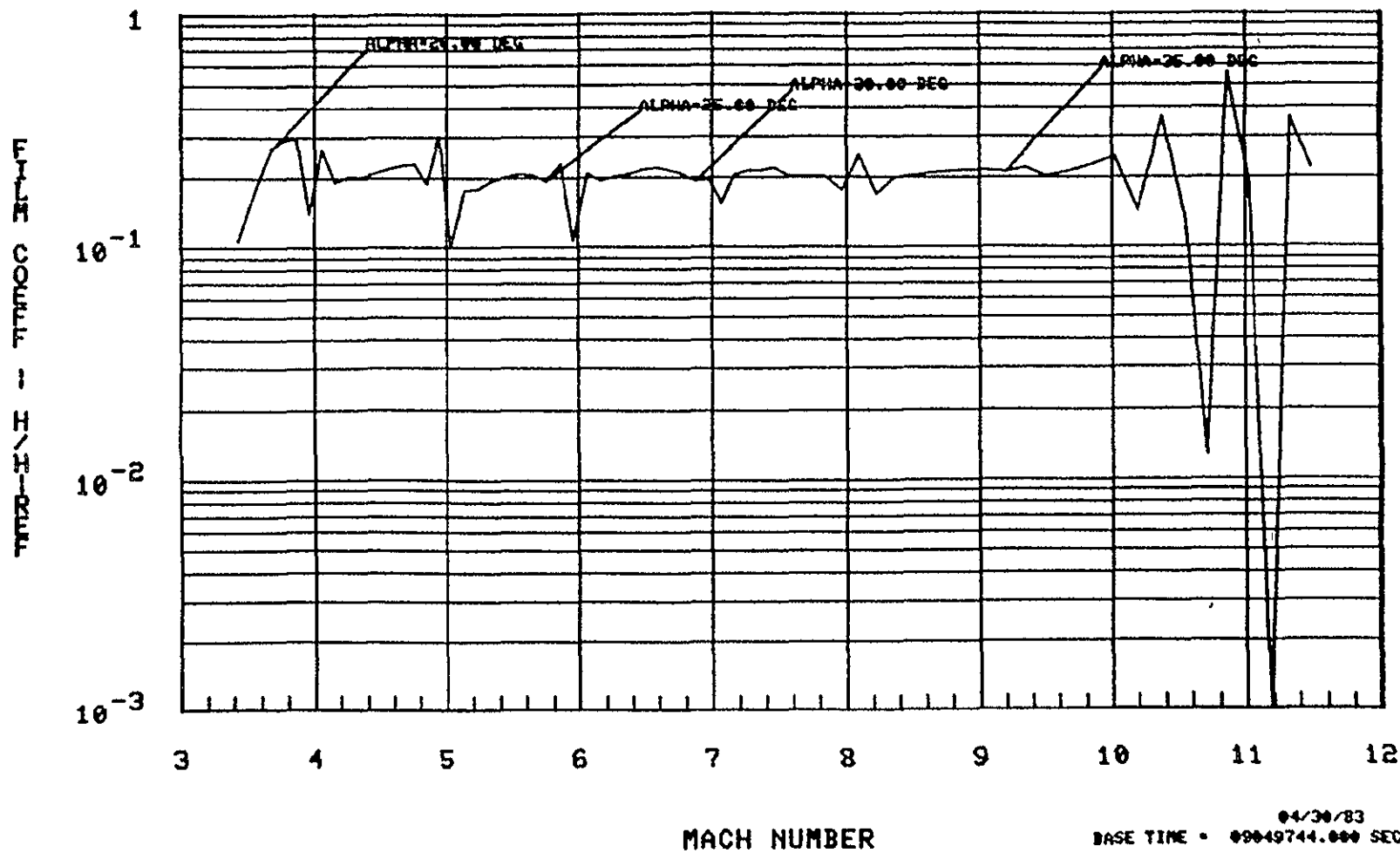
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ANGLE-OF-ATTACK - DEG

04/23/83  
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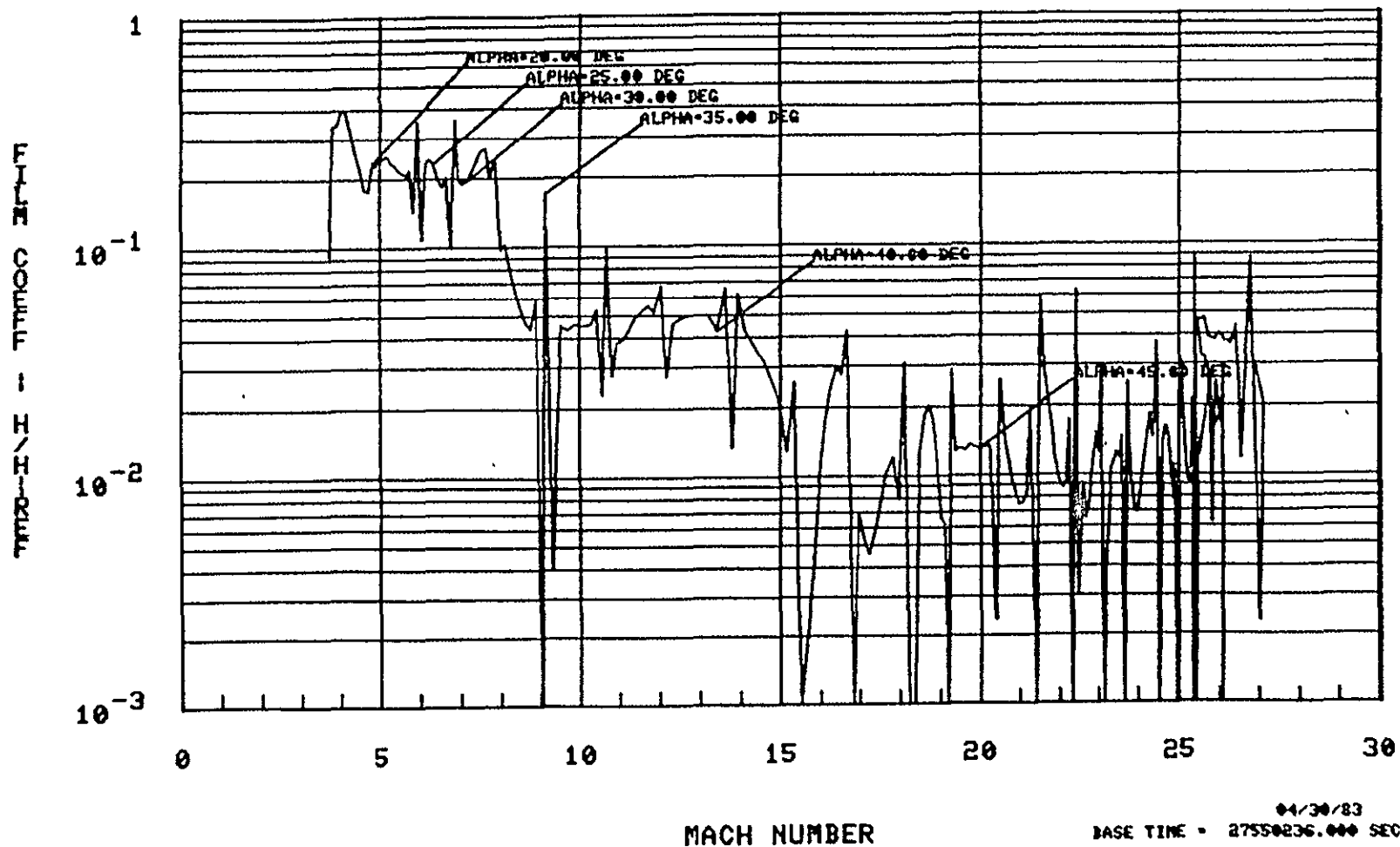
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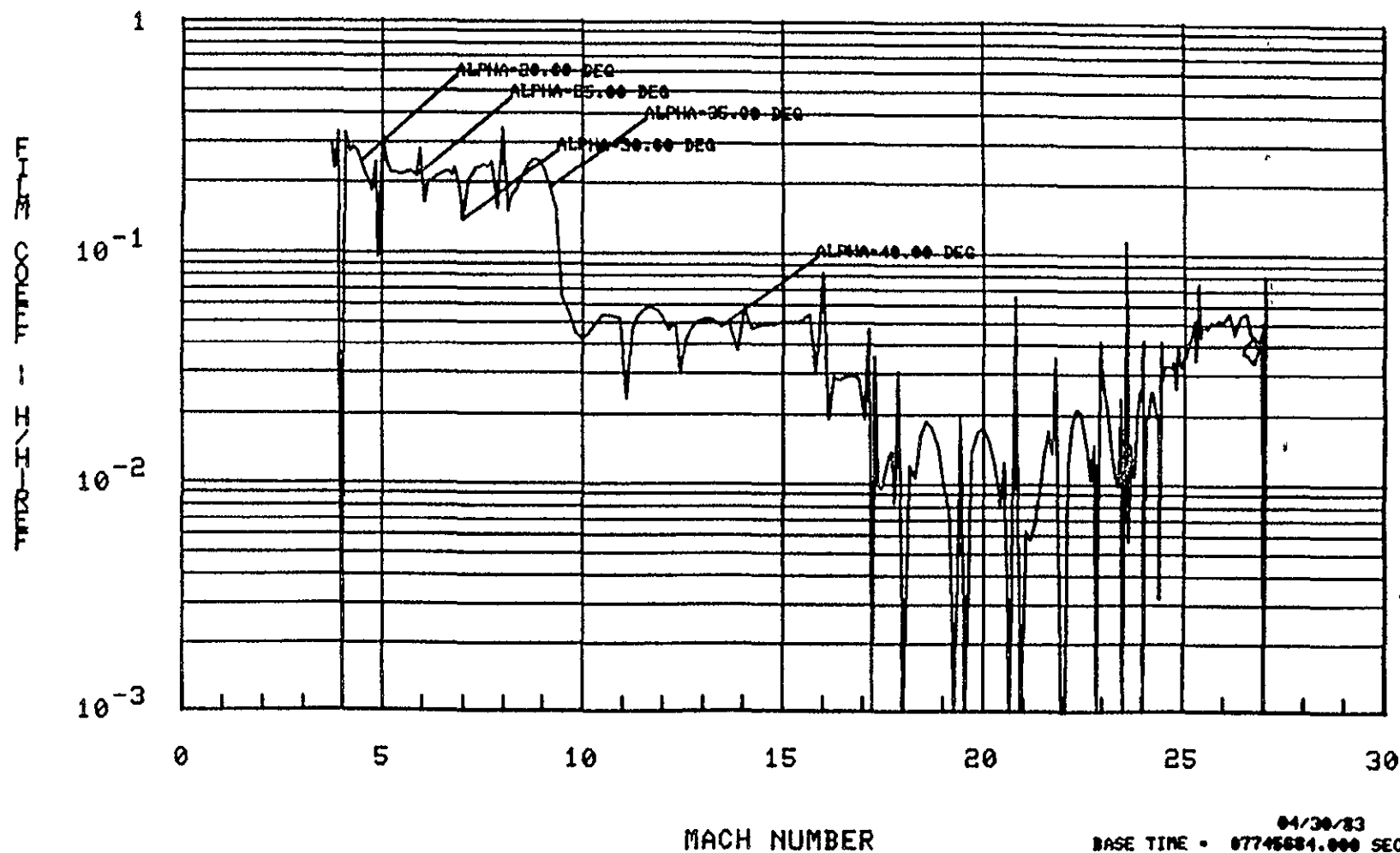
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# ST5-3 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

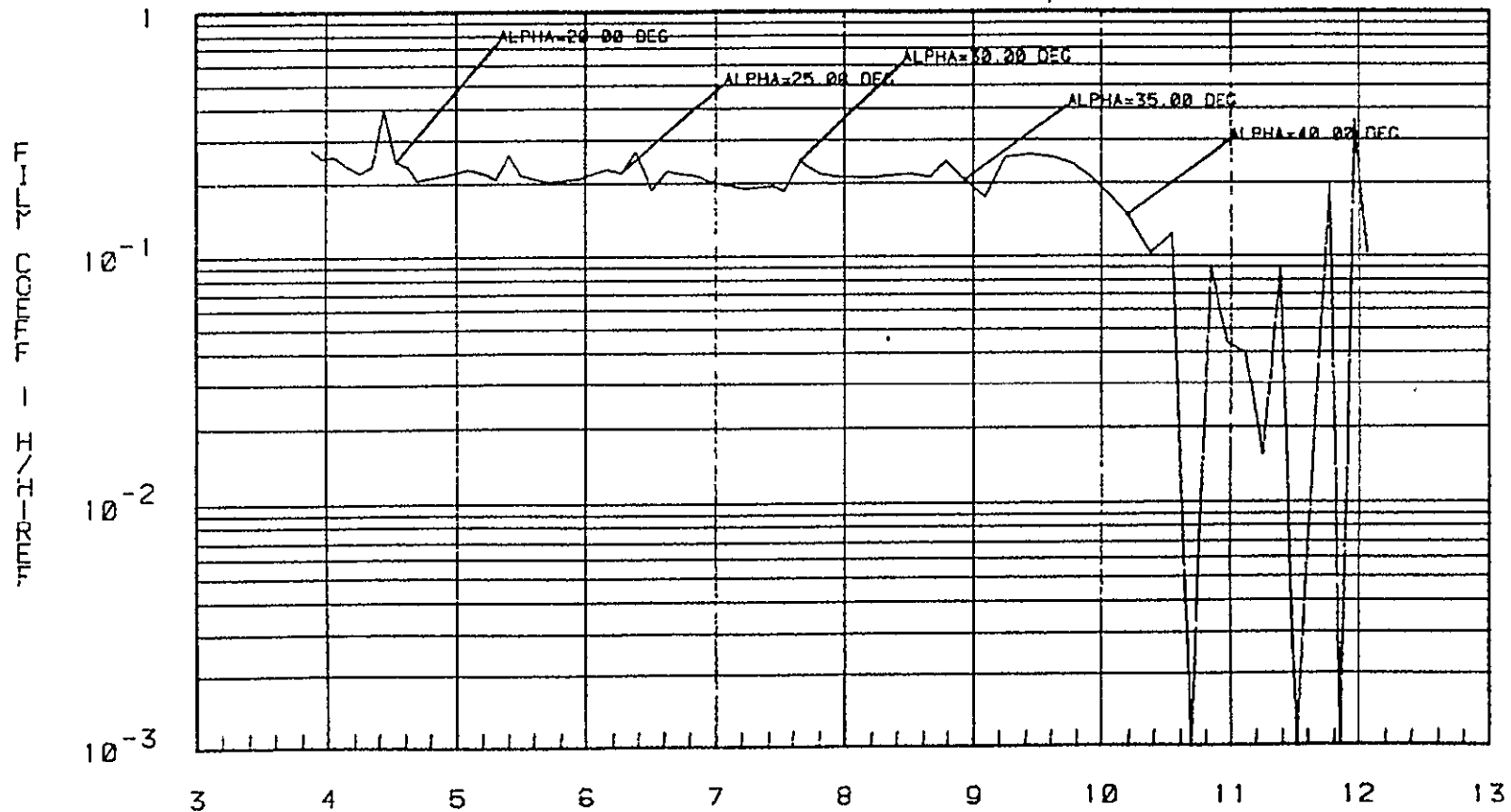
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———— V09T0751A/H-REF 065-1300 SEC



B-359

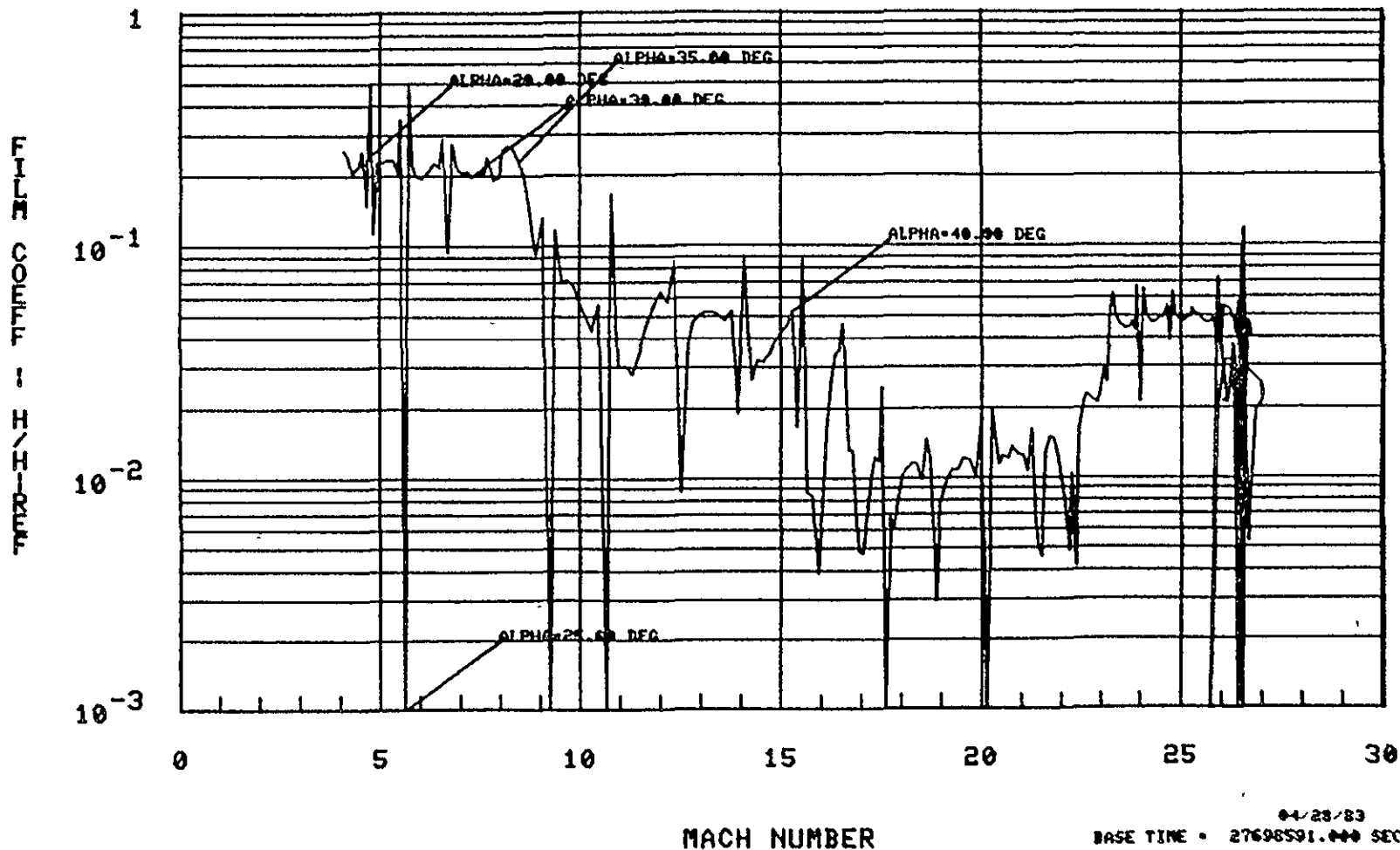
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MACH NUMBER

05/02/83  
BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

U09T9751A/H-REF 150-1350 SEC



B-360

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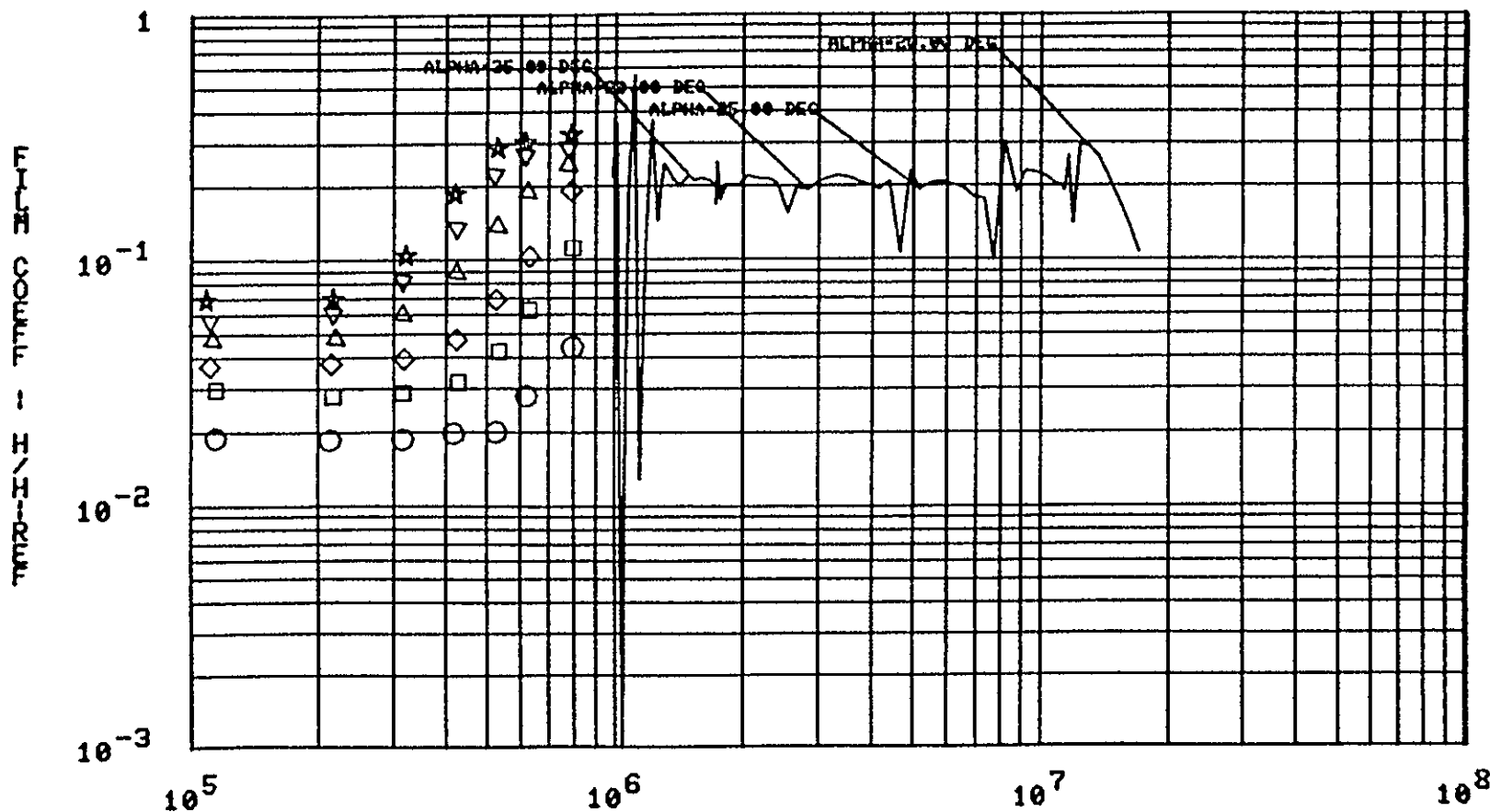


# STS-1 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
◇  
□  
△  
▽  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

U09T9751A/H-REF 1065-1460 SEC



B-361

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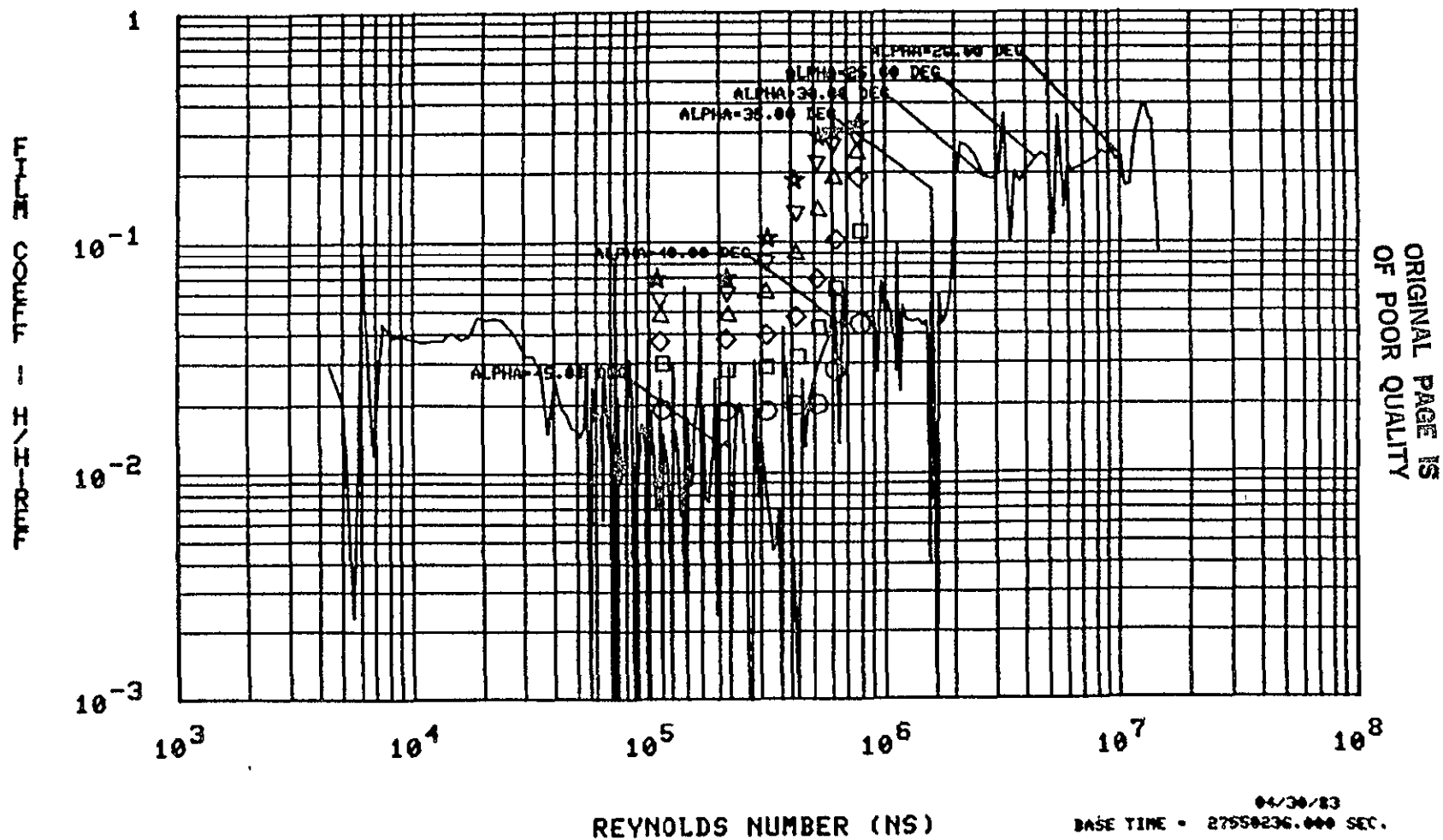
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04/30/83  
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# STS-2 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISON

○ OH39 ALPHA = 20 DEGREES  
 □ OH39 ALPHA = 25 DEGREES  
 ◇ OH39 ALPHA = 30 DEGREES  
 △ OH39 ALPHA = 35 DEGREES  
 ▼ OH39 ALPHA = 40 DEGREES  
 ★ OH39 ALPHA = 45 DEGREES

U09T9751A/H-REF 200-1480 SEC



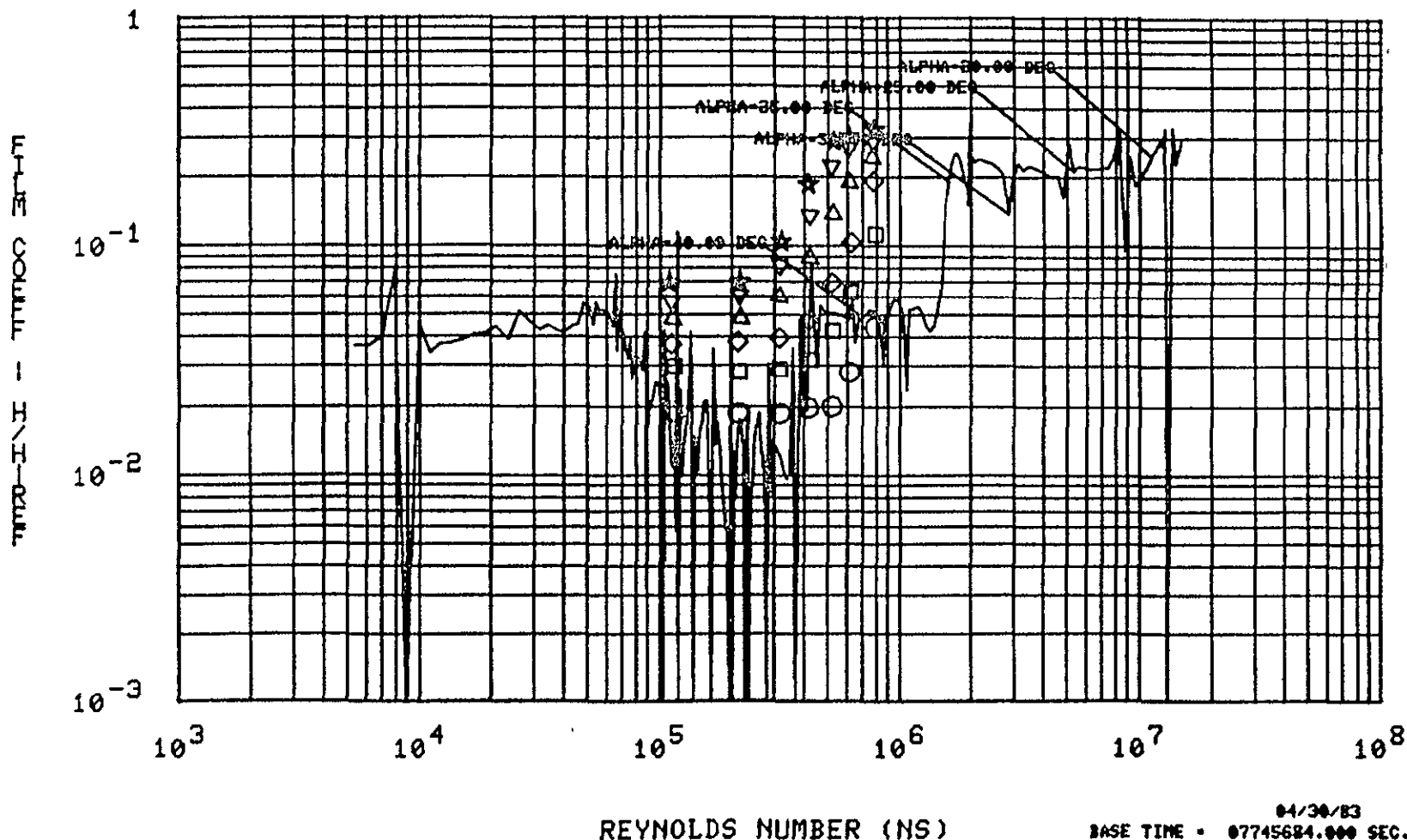
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# STS-3 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

○  
◇  
△  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

U09T9751A/H-REF 200-1380 SEC



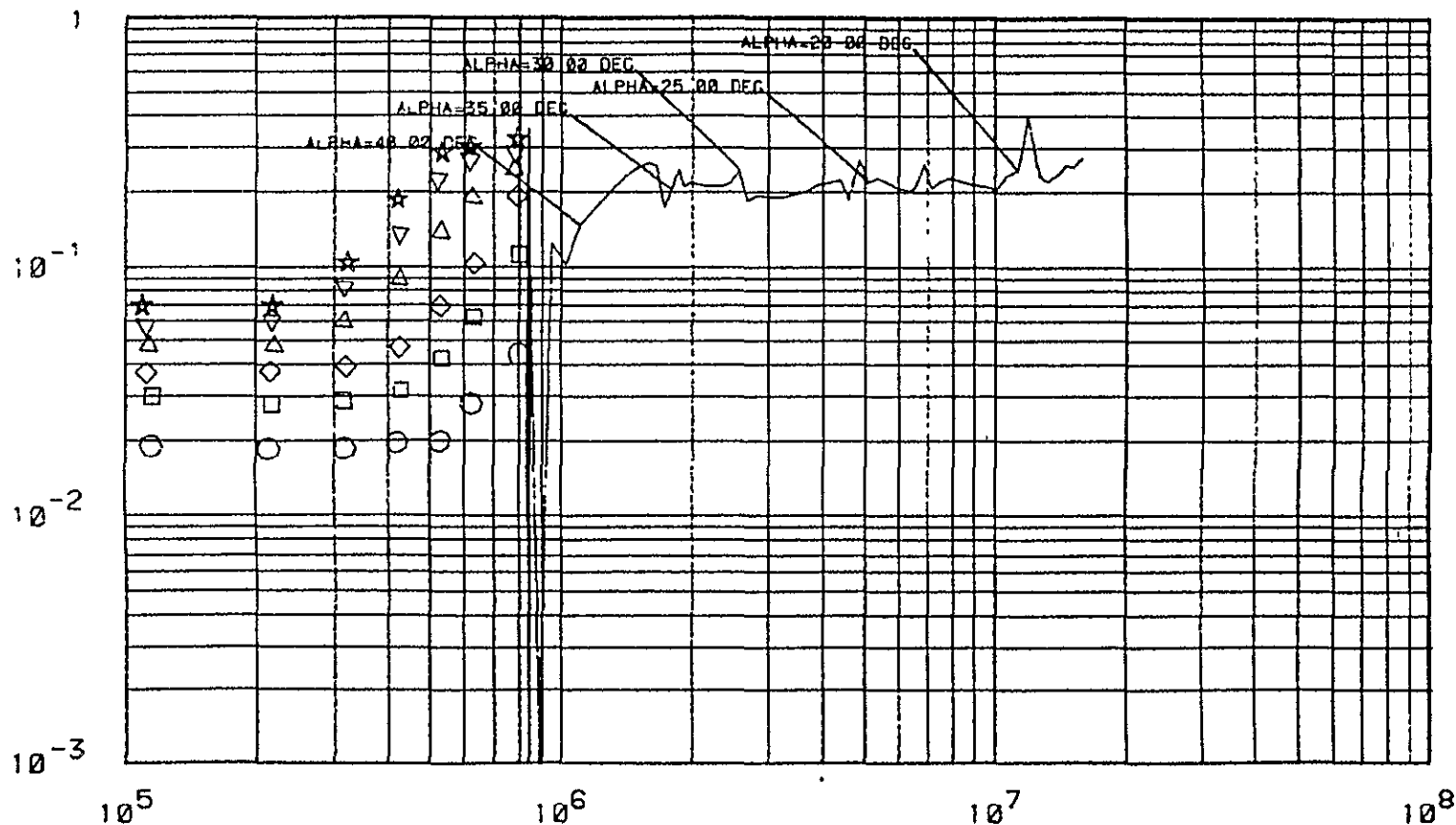
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# STS-4 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISON

○  
□  
◇  
△  
▽  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

V00T0751A/H-REF 065-1300 SEC



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B-364

REYNOLDS NUMBER (NS)

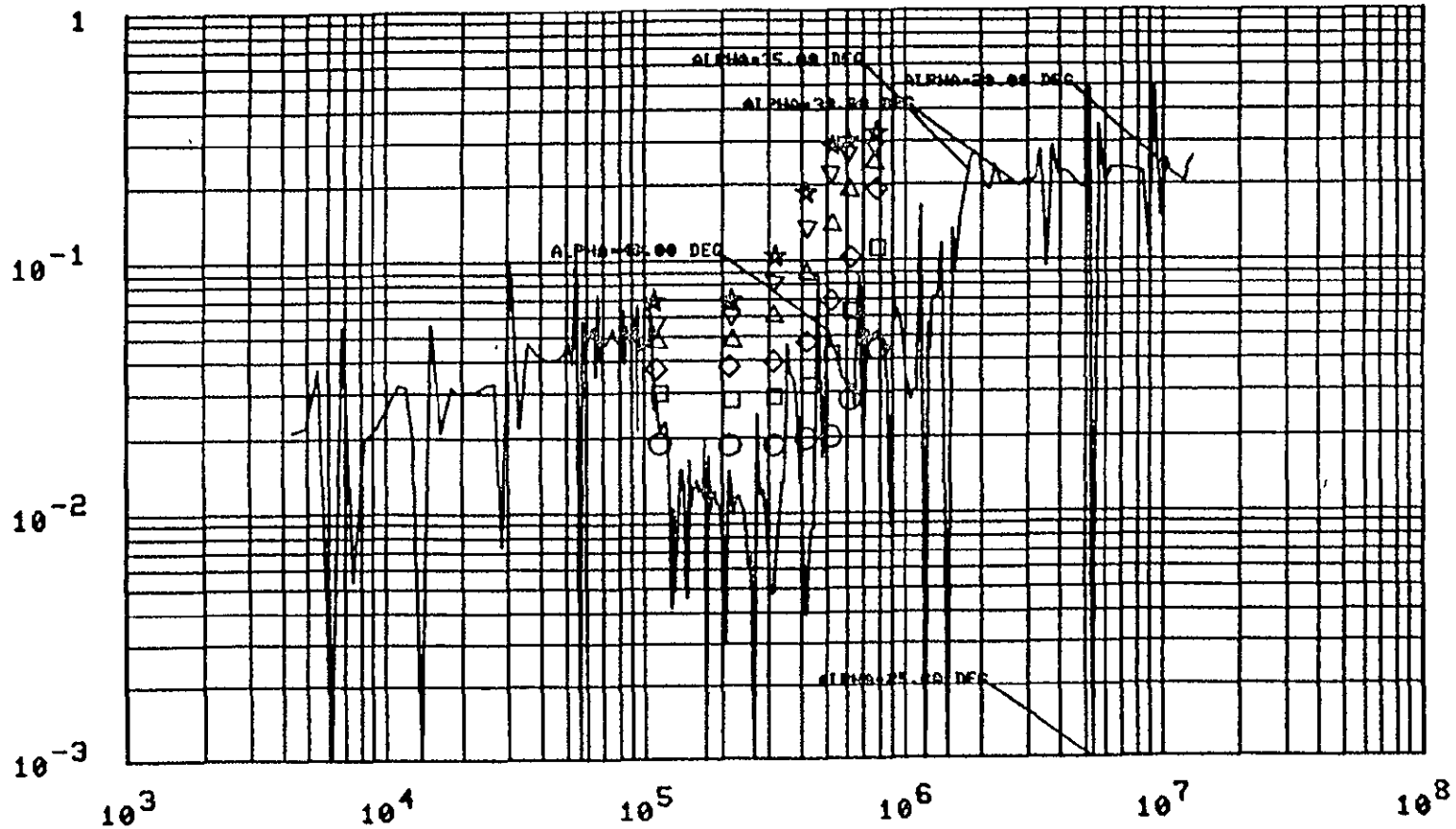
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# STS-5 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISON

○ OH39 ALPHA = 20 DEGREES  
 ◇ OH39 ALPHA = 25 DEGREES  
 △ OH39 ALPHA = 30 DEGREES  
 ▽ OH39 ALPHA = 35 DEGREES  
 ▲ OH39 ALPHA = 40 DEGREES  
 ★ OH39 ALPHA = 45 DEGREES

U09T9751A/H-REF 150-1350 SEC

WING COEFFICIENT -  $C_{L}/C_{D}$



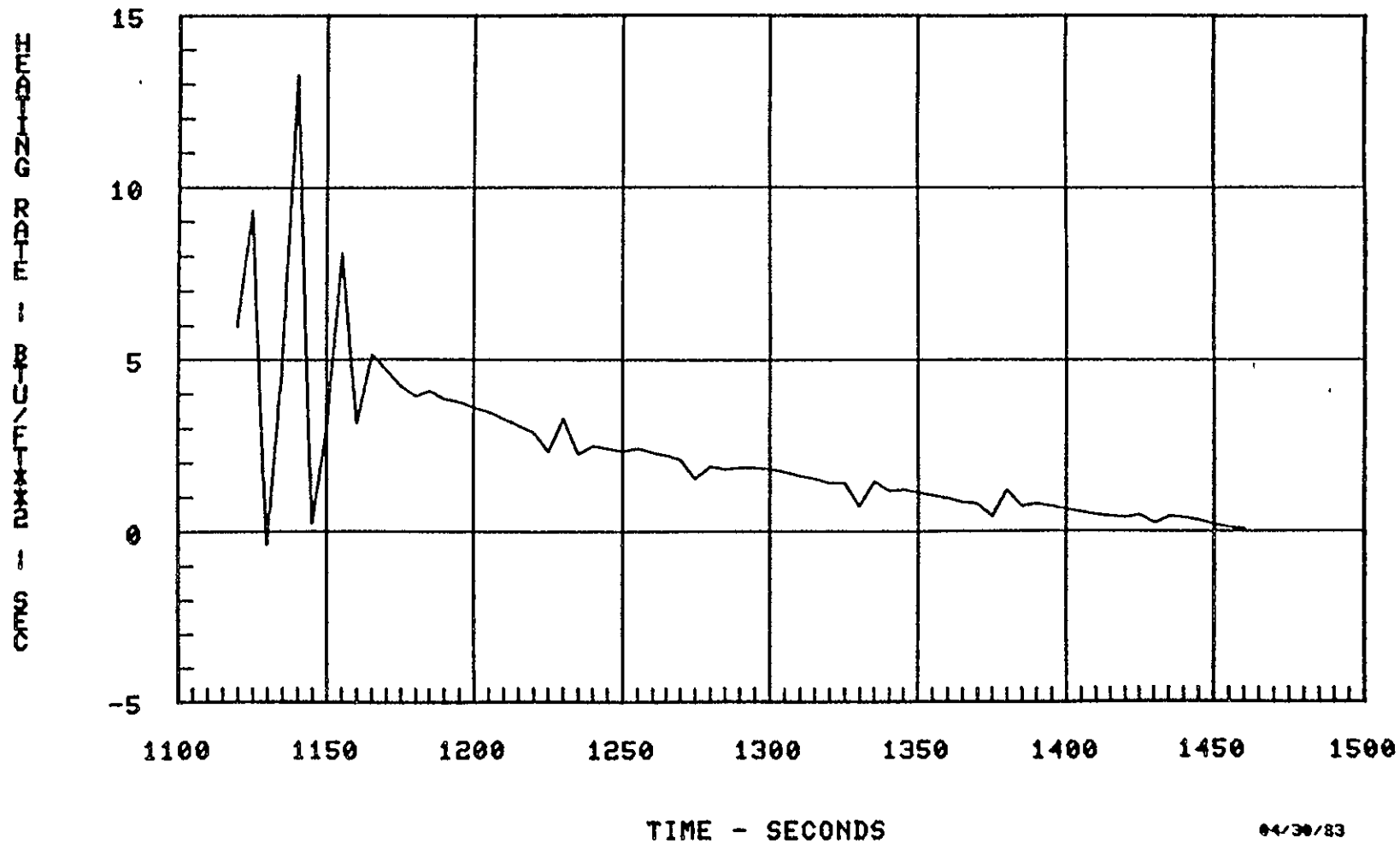
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REYNOLDS NUMBER (NS)

04/28/83  
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# STS-1 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

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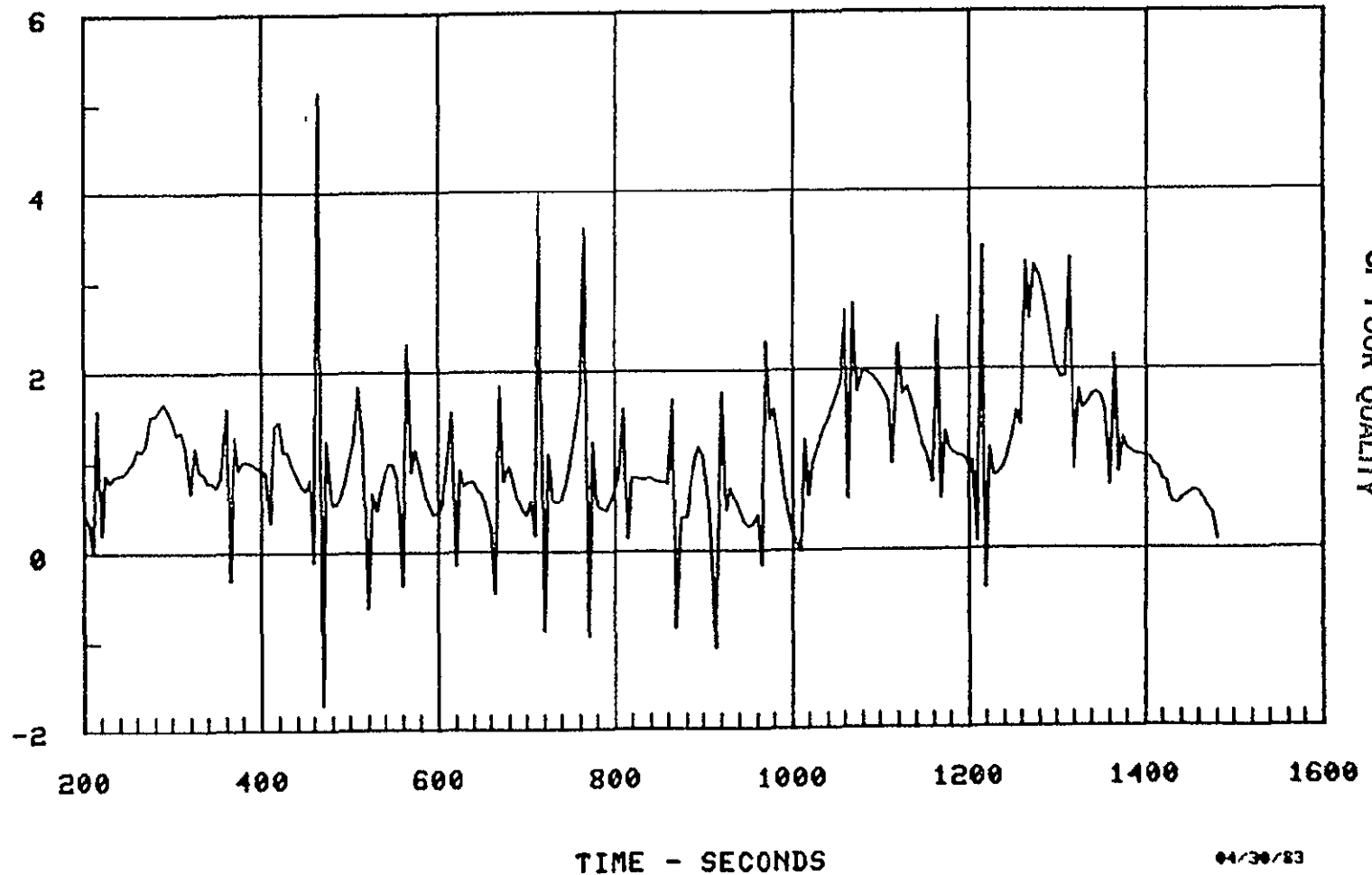
B-366

04/30/83

# STS-2 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

U09T9751A

FLIGHTING RATE - STATION - SMO

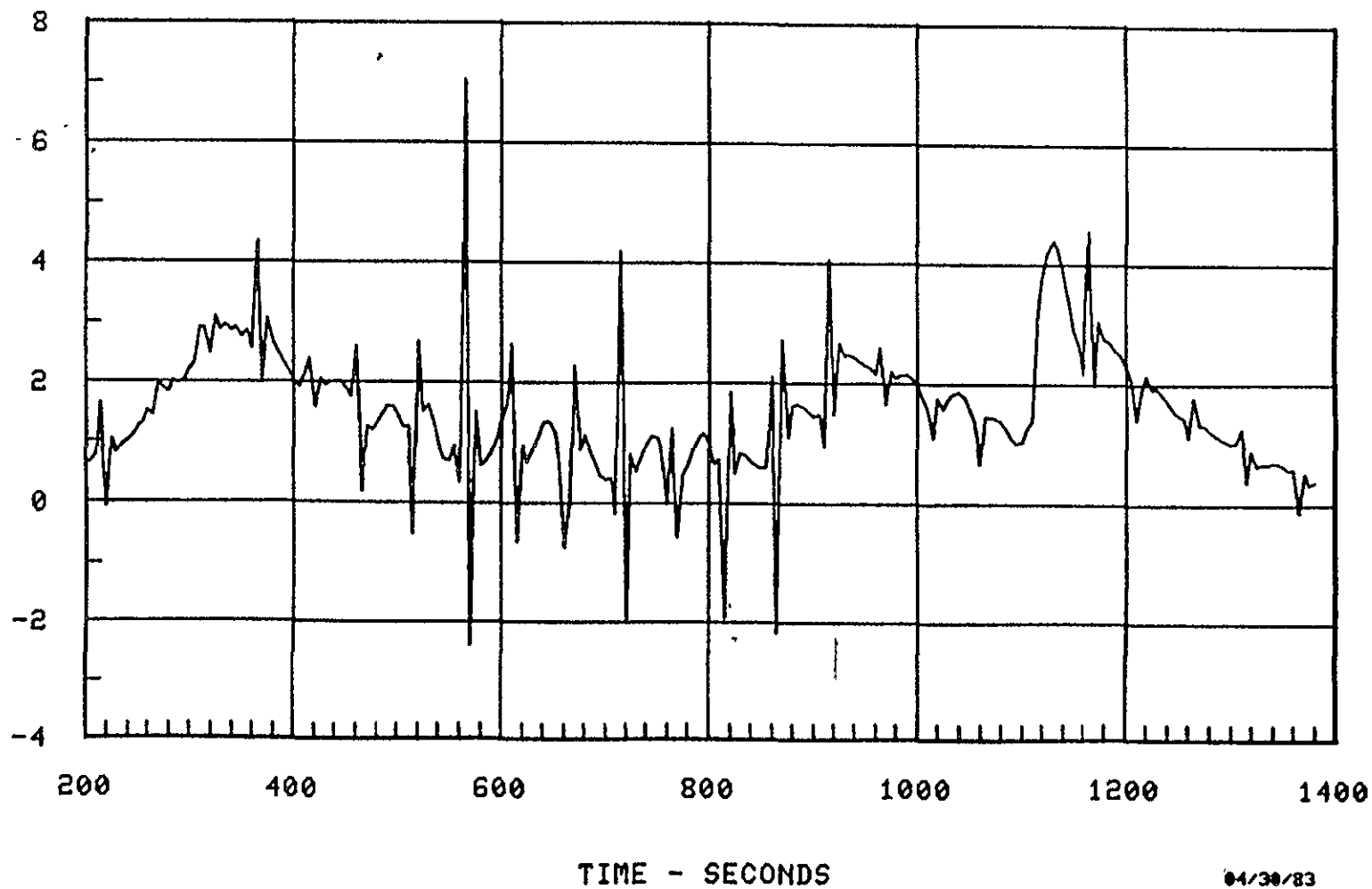


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04/30/83

STS-3 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

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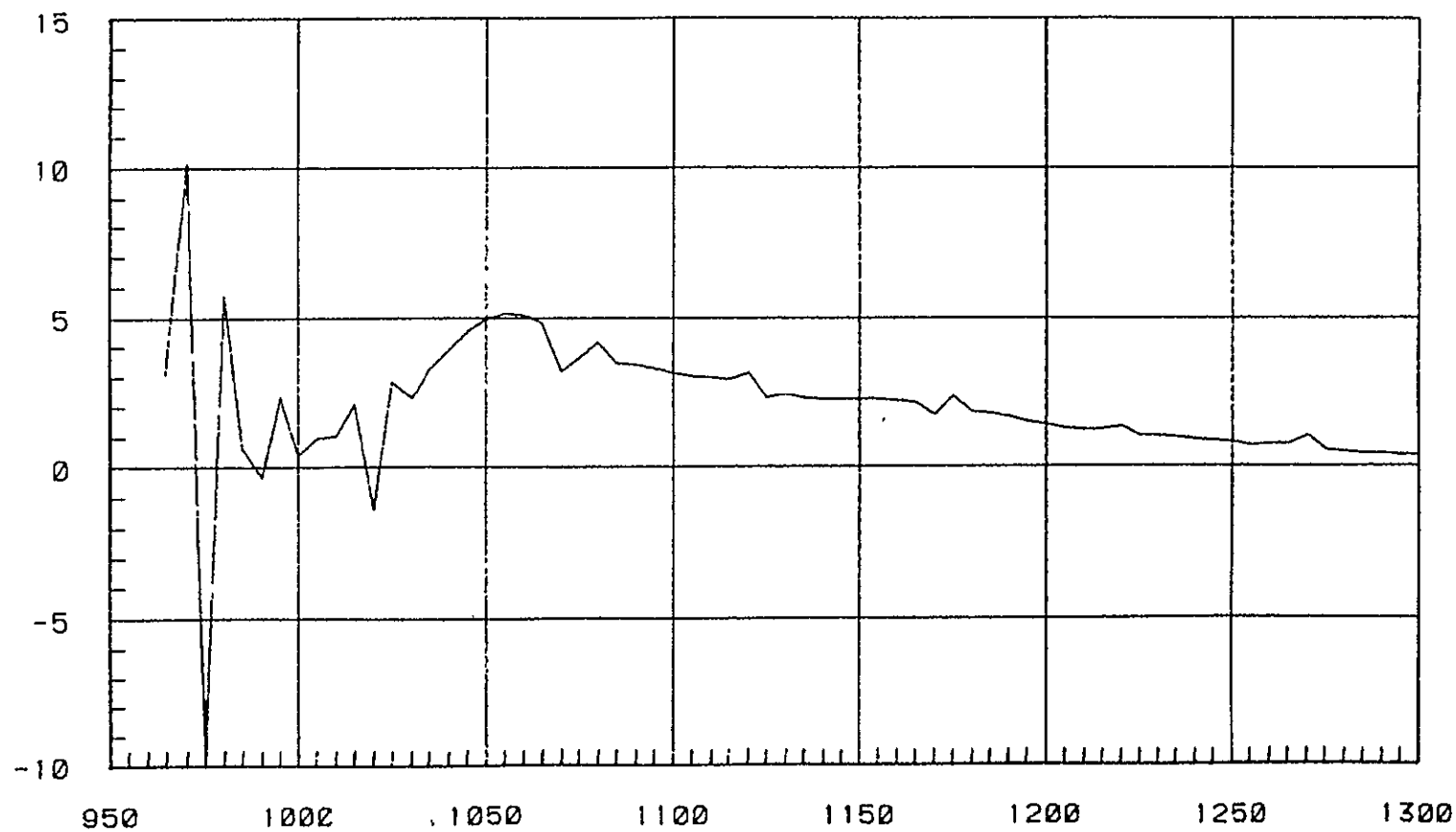
B-368



# STS-4 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

V09T0751A

HEATING RATE - BUTT\* - SEC



TIME - SECONDS

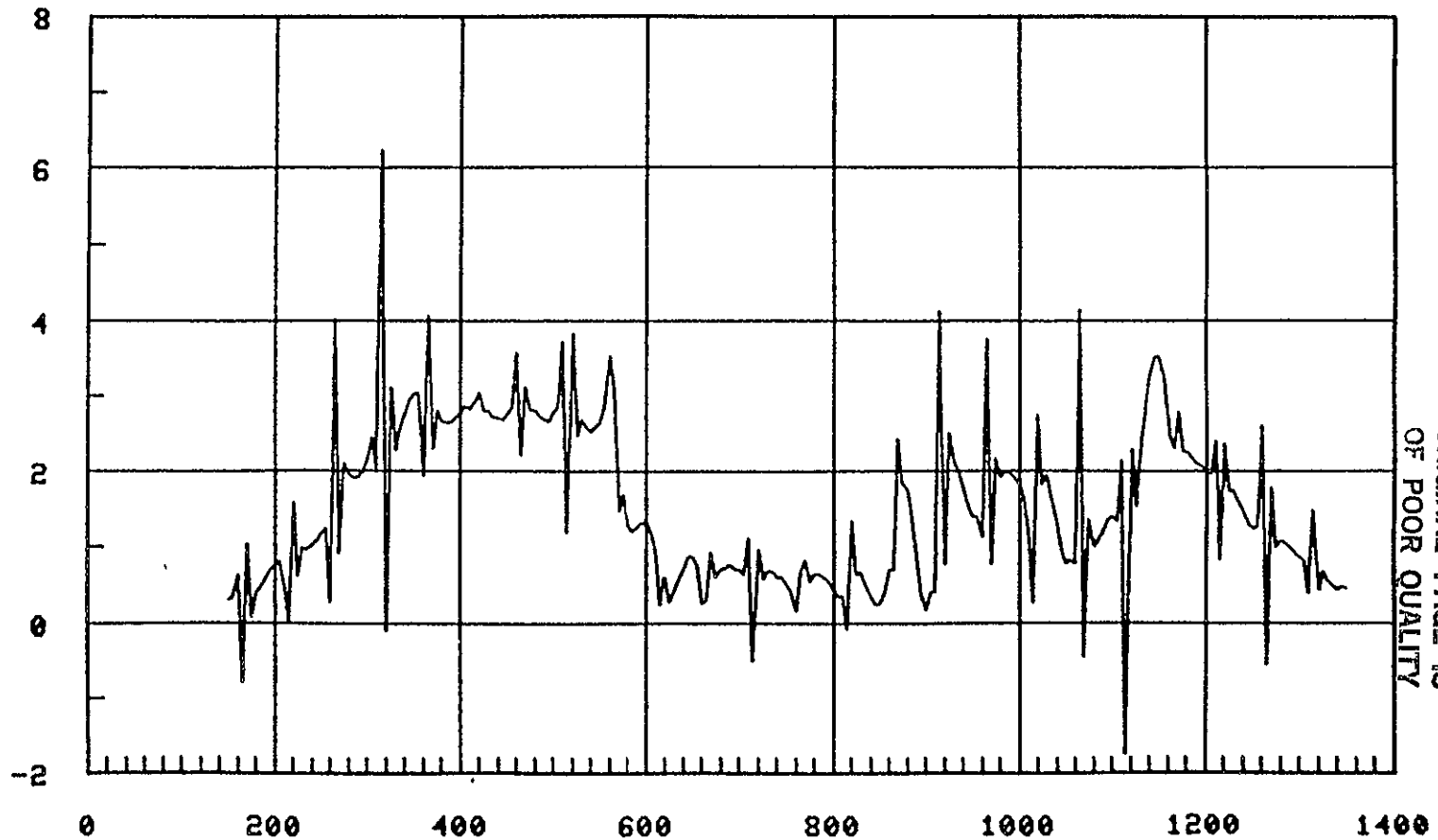
05/02/83

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# STS-5 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

U09T9751A

INTEGRATED -- B-370 -- CUBO



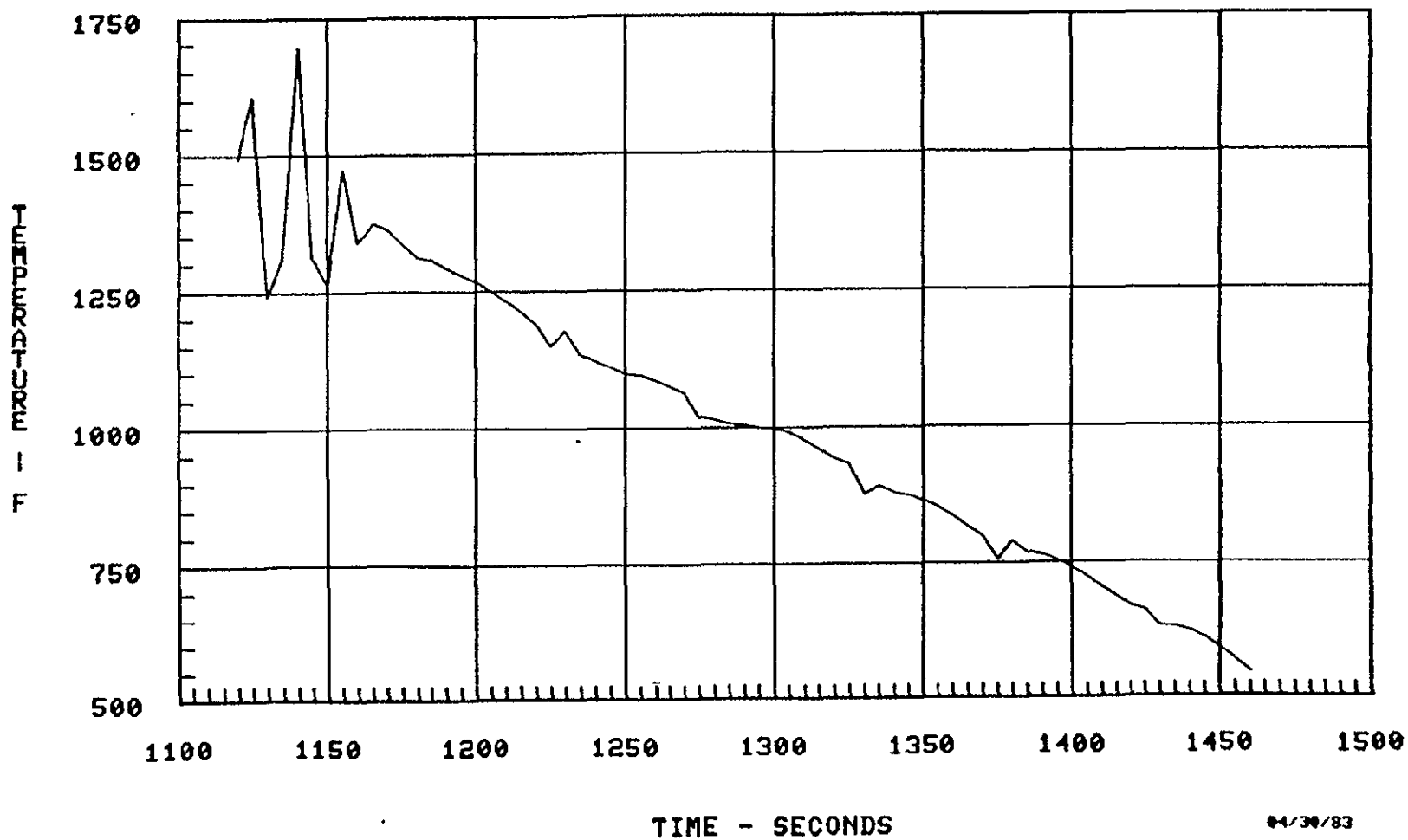
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TIME - SECONDS

04/28/83

STS-1 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

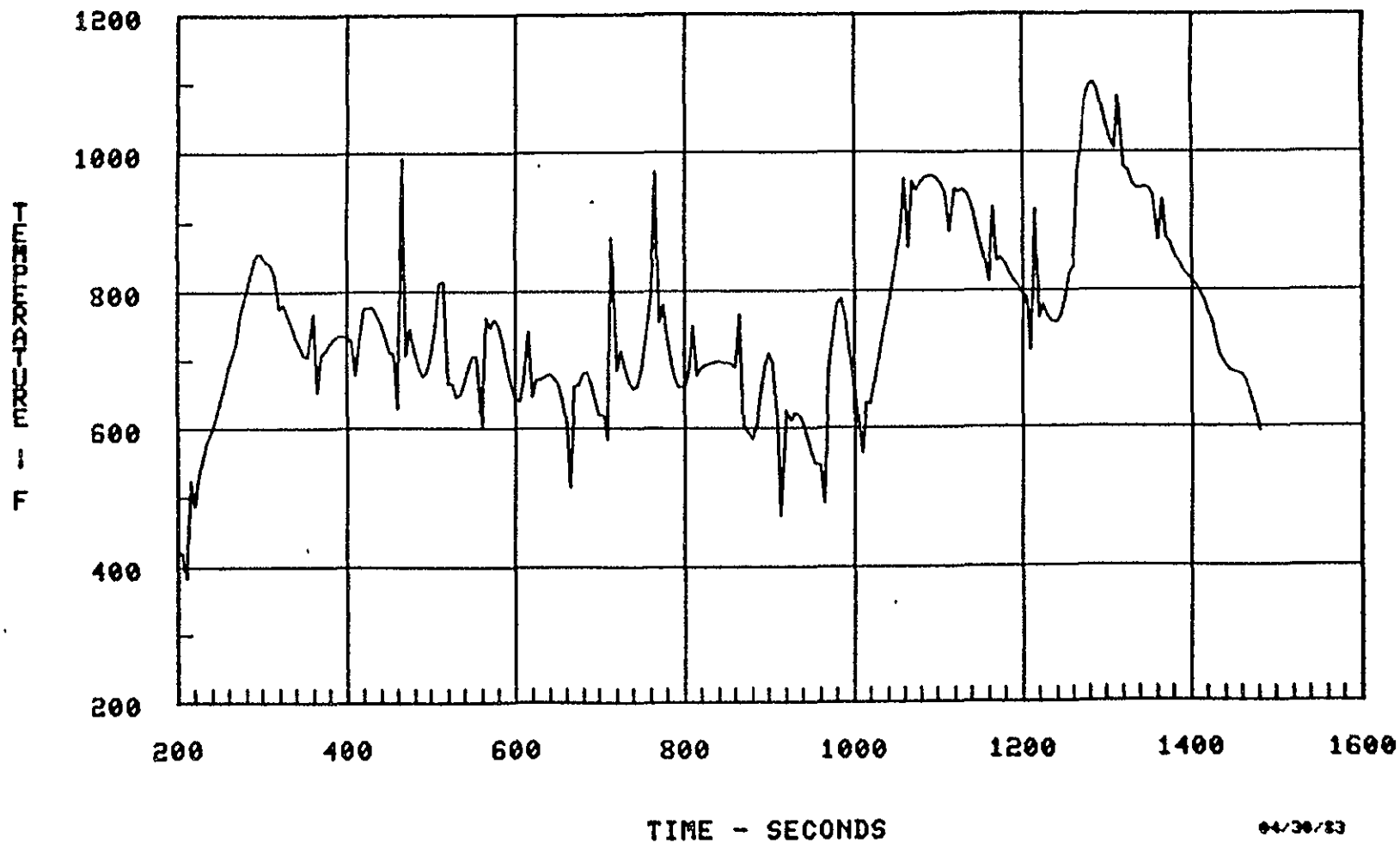
U09T9751A



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# STS-2 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

U09T9751A



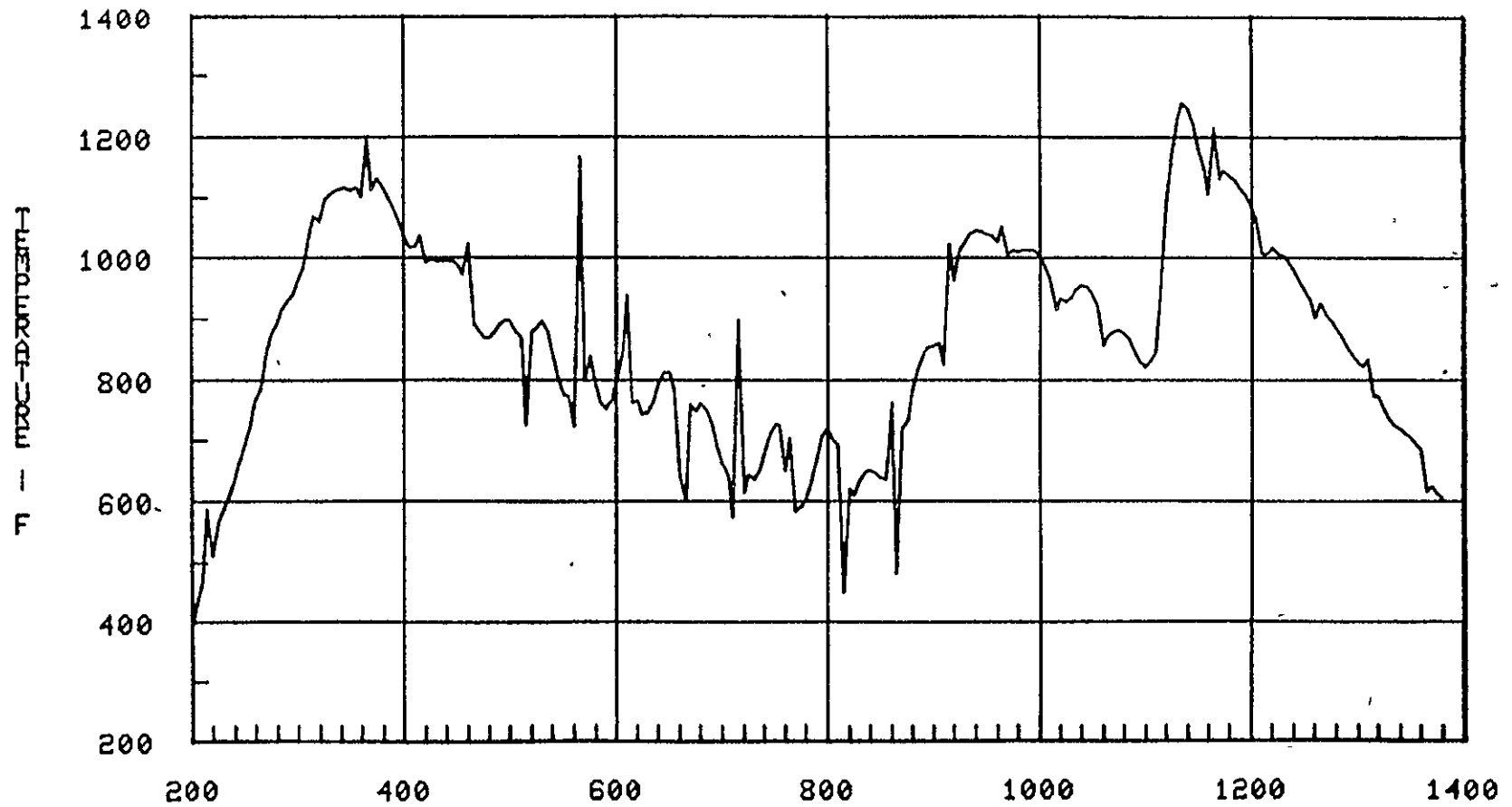
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B-372

04/30/83

STS-3 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

U09T9751A



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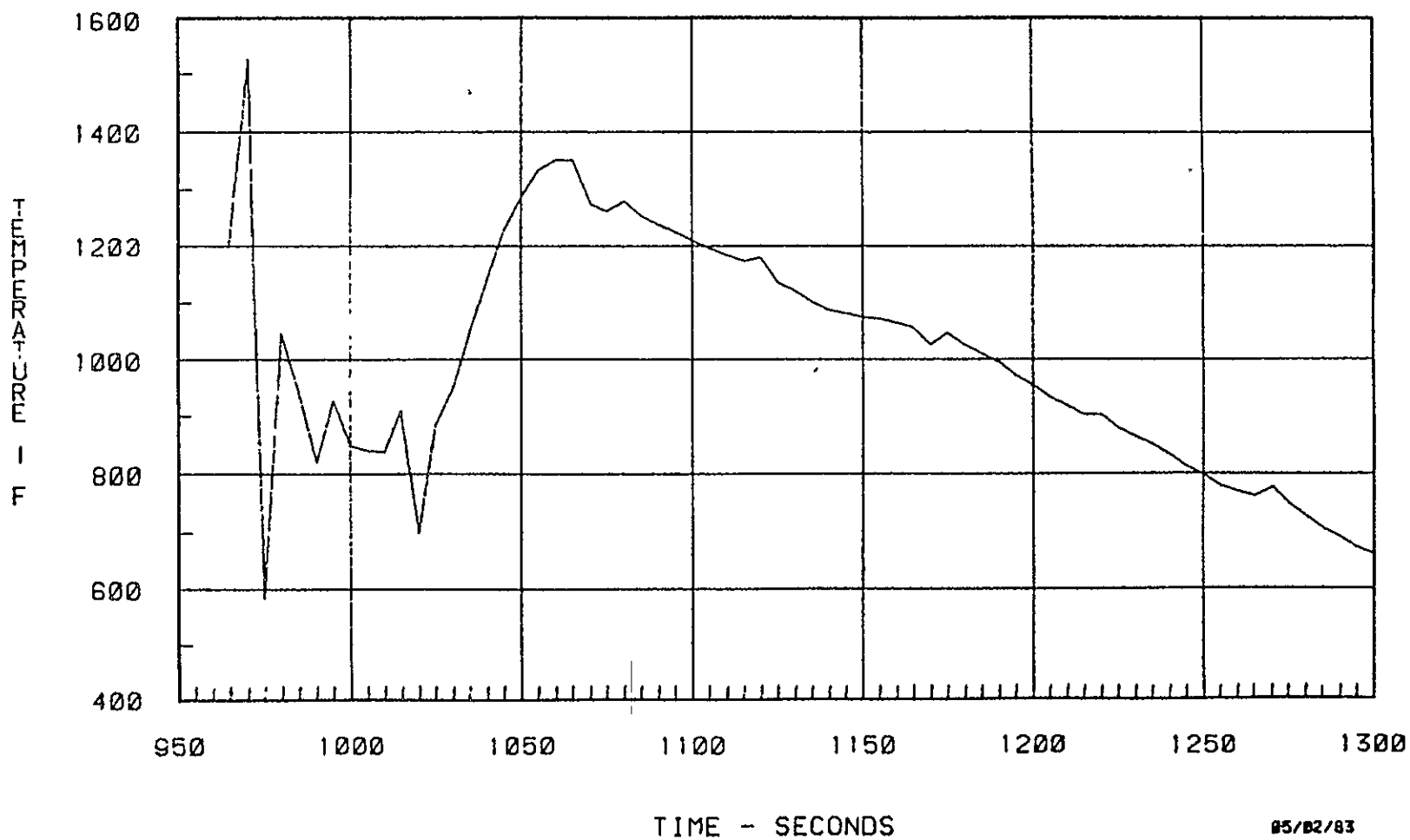
B-373

TIME - SECONDS

04/30/83

# STS-4 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

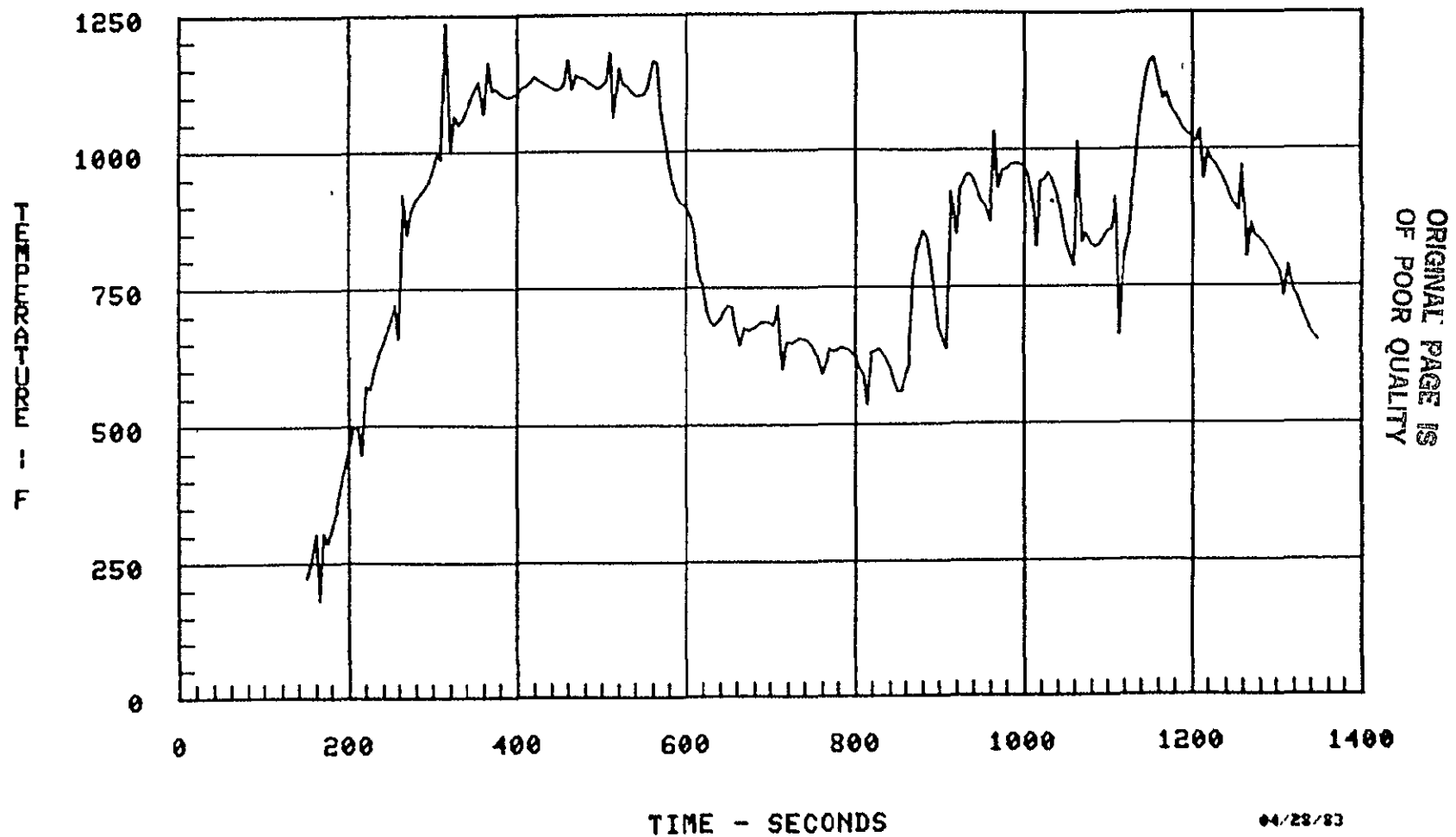
V09T0751A



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# STS-5 (107 FT LENGTH CL X/L=0.95) FLIGHT PARAMETER COMPARISO

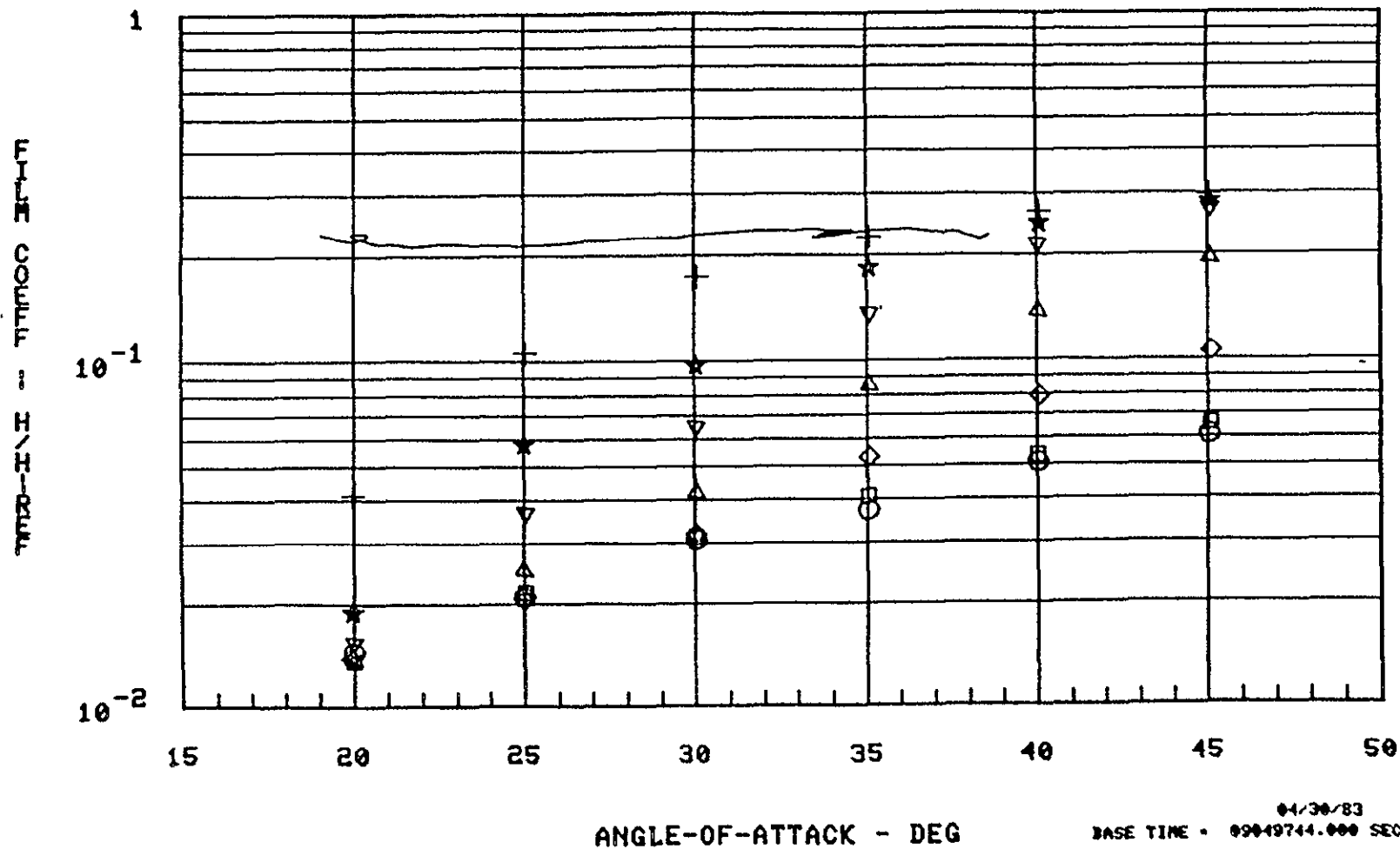
U09T9751A



# STS-1 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

○ OH39 0.0175 SCALE RE = 0.5 E06  
 □ OH39 0.0175 SCALE RE = 1.0 E06  
 ◇ OH39 0.0175 SCALE RE = 1.5 E06  
 △ OH39 0.0175 SCALE RE = 2.0 E06  
 ▽ OH39 0.0175 SCALE RE = 2.5 E06  
 ☆ OH39 0.0175 SCALE RE = 3.0 E06  
 + OH39 0.0175 SCALE RE = 3.7 E06

U07T9492A/H-REF 1065-1460 SEC



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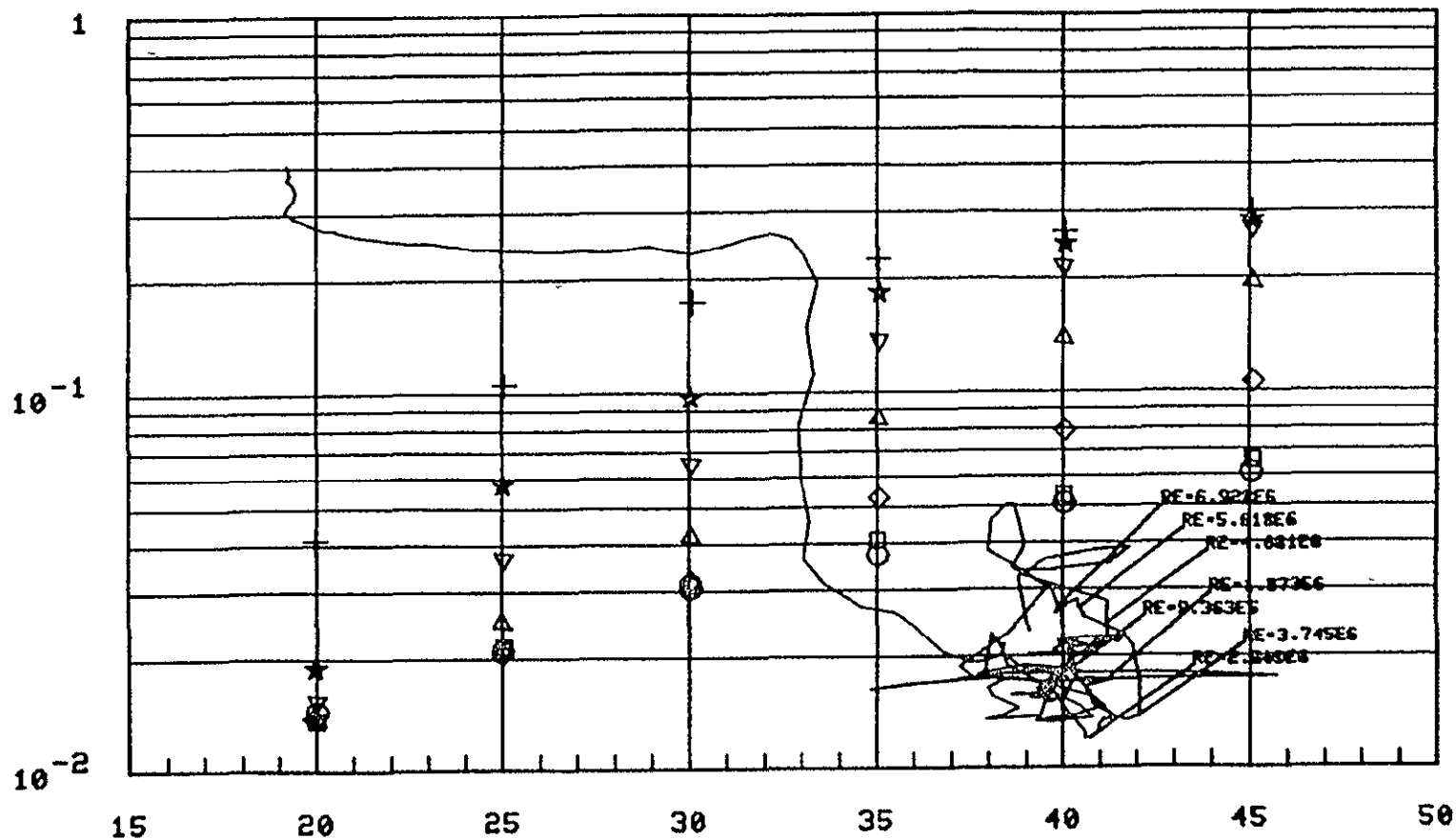
# STS-2 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

○  
◇  
▽  
△  
★  
+

OH39 0.0175 SCALE RE = 0.5 E06  
OH39 0.0175 SCALE RE = 1.0 E06  
OH39 0.0175 SCALE RE = 1.5 E06  
OH39 0.0175 SCALE RE = 2.0 E06  
OH39 0.0175 SCALE RE = 2.5 E06  
OH39 0.0175 SCALE RE = 3.0 E06  
OH39 0.0175 SCALE RE = 3.7 E06

U07T9492A/H-REF 200-1480 SEC

LINE COUNT - H/H-DUAL



ANGLE-OF-ATTACK - DEG

04/30/83  
BASE TIME = 27550236.000 SEC.

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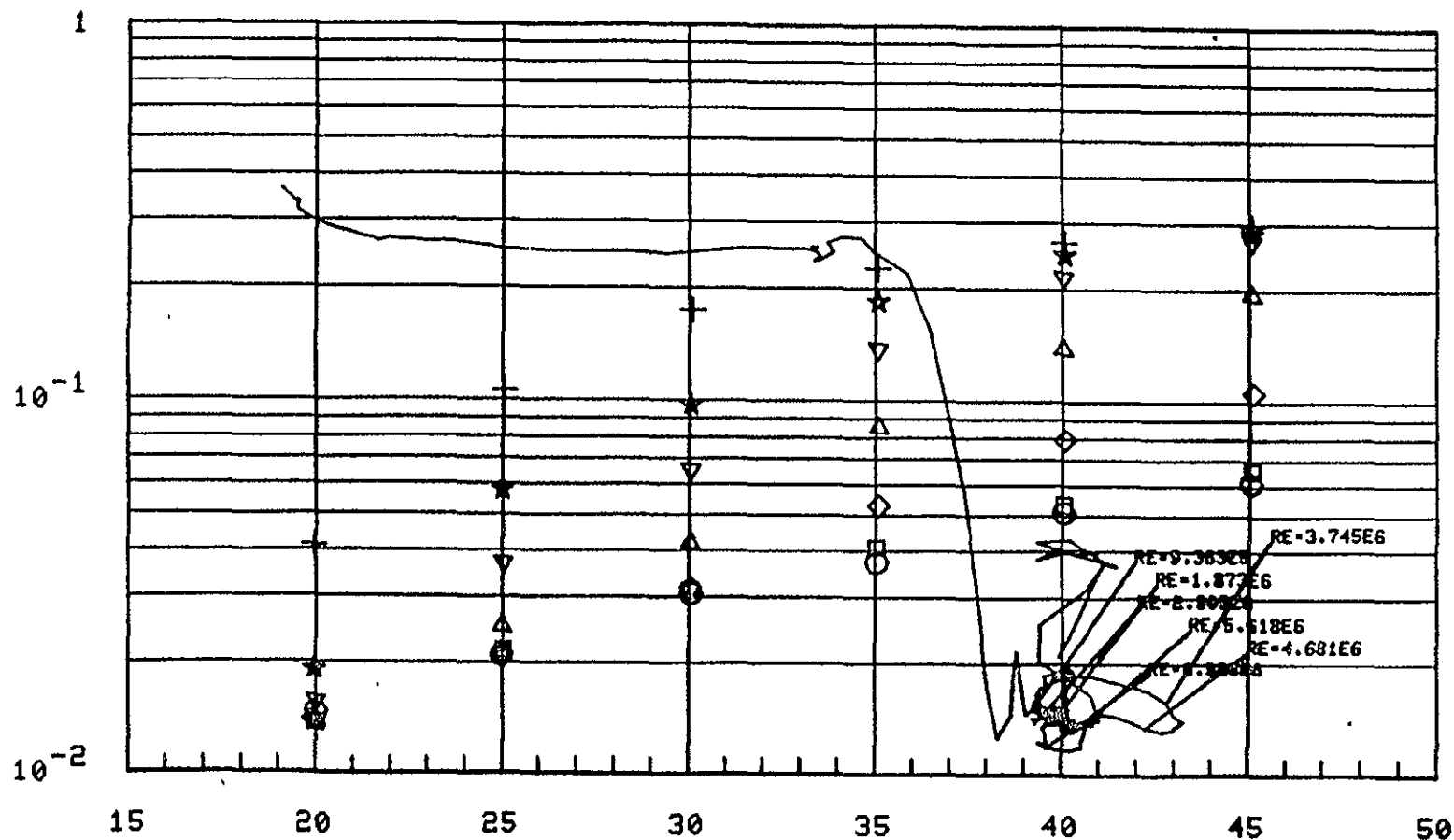
# STS-3 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
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★  
+

OH39 0.0175 SCALE RE = 0.5 E06  
OH39 0.0175 SCALE RE = 1.0 E06  
OH39 0.0175 SCALE RE = 1.5 E06  
OH39 0.0175 SCALE RE = 2.0 E06  
OH39 0.0175 SCALE RE = 2.5 E06  
OH39 0.0175 SCALE RE = 3.0 E06  
OH39 0.0175 SCALE RE = 3.7 E06

U07T9492A/H-REF 200-1380 SEC

WAVE COEFFICIENT - I/I-REF



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ANGLE-OF-ATTACK - DEG

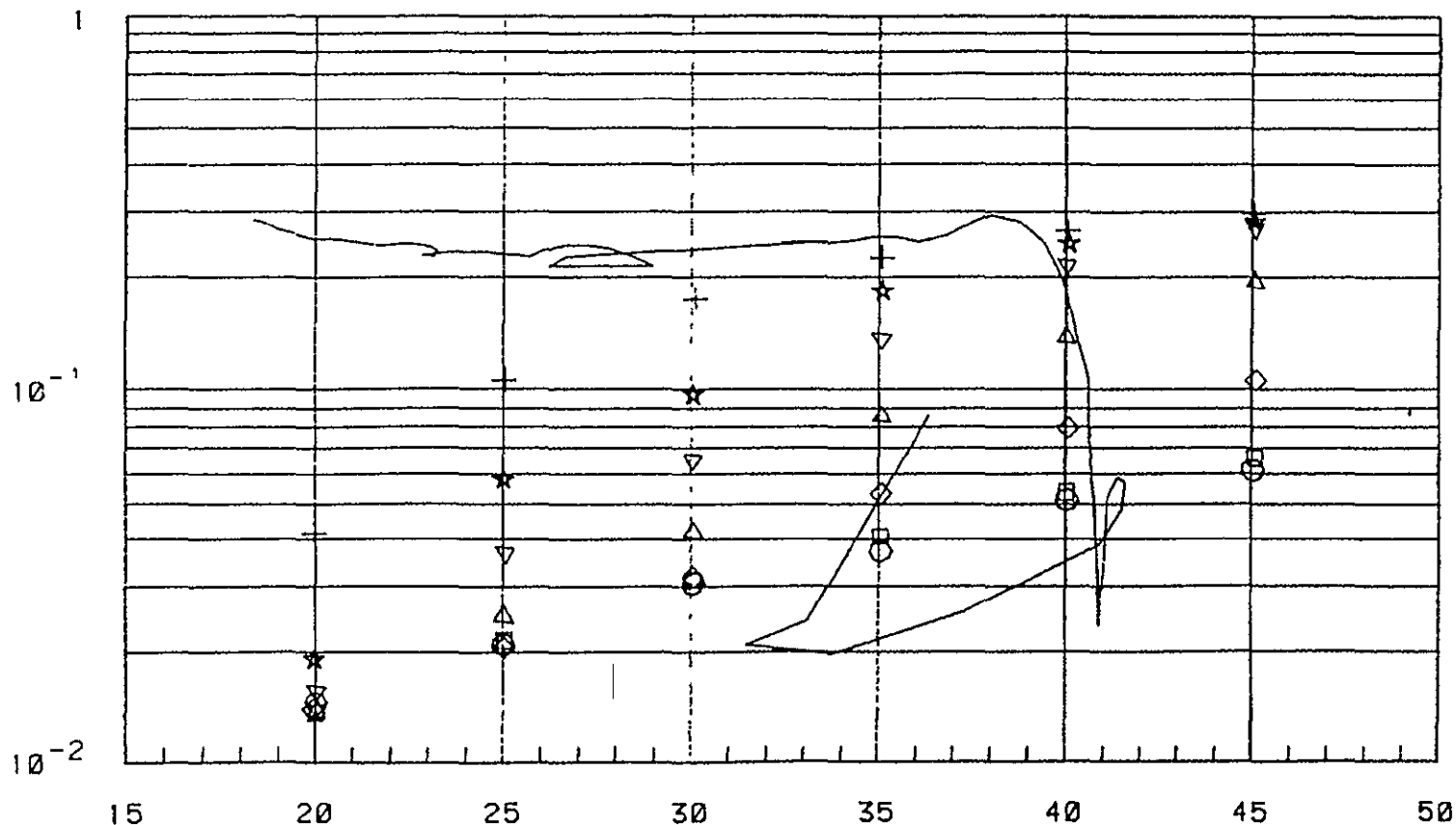
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# STS-4 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISON

○  
◇  
△  
▽  
★  
+

OH30 0.0175 SCALE RE = 0.5 E06  
 OH30 0.0175 SCALE RE = 1.0 E06  
 OH30 0.0175 SCALE RE = 1.5 E06  
 OH30 0.0175 SCALE RE = 2.0 E06  
 OH30 0.0175 SCALE RE = 2.5 E06  
 OH30 0.0175 SCALE RE = 3.0 E06  
 OH30 0.0175 SCALE RE = 3.7 E06

V07T0402A/H-REF 065-1300 SEC



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ANGLE-OF-ATTACK - DEG

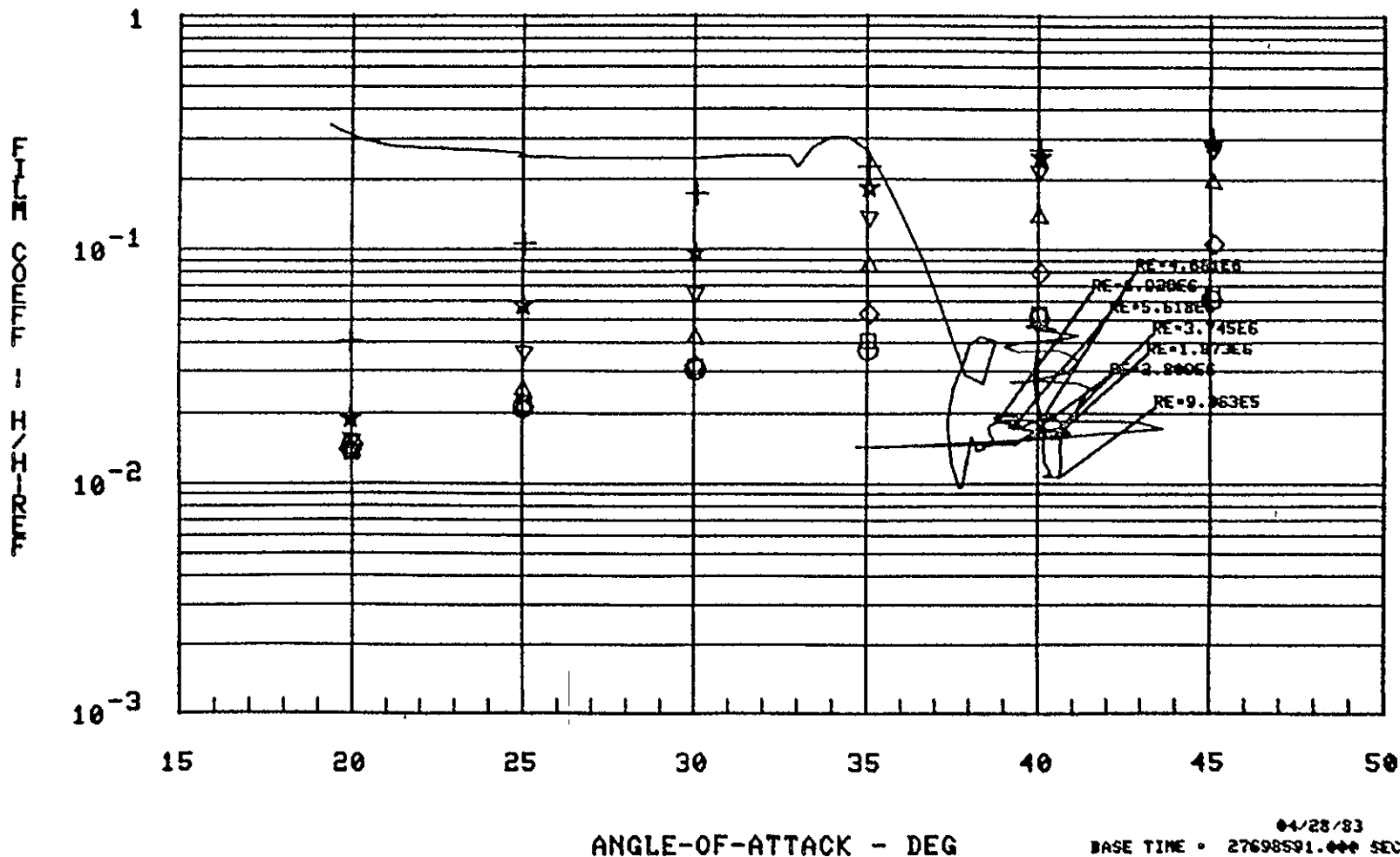
05/02/83  
 BASE TIME = 16040423.000 SEC.

# STS-5 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★  
+

0H39 0.0175 SCALE RE = 0.5 E06  
0H39 0.0175 SCALE RE = 1.0 E06  
0H39 0.0175 SCALE RE = 1.5 E06  
0H39 0.0175 SCALE RE = 2.0 E06  
0H39 0.0175 SCALE RE = 2.5 E06  
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U07T9492A/H-REF 150-1350 SEC

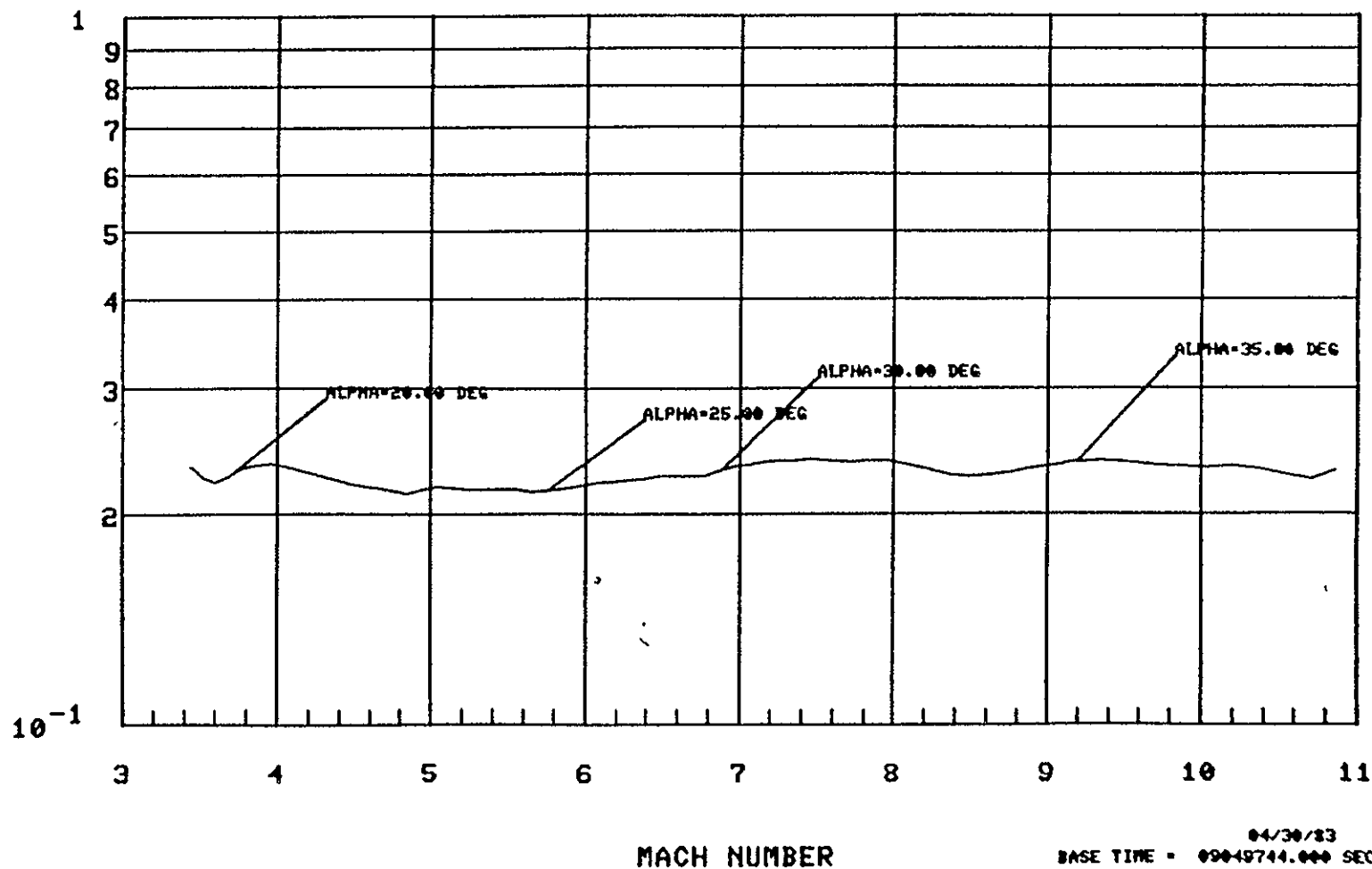


B-380

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U07T9492A/H-REF 1065-1460 SEC

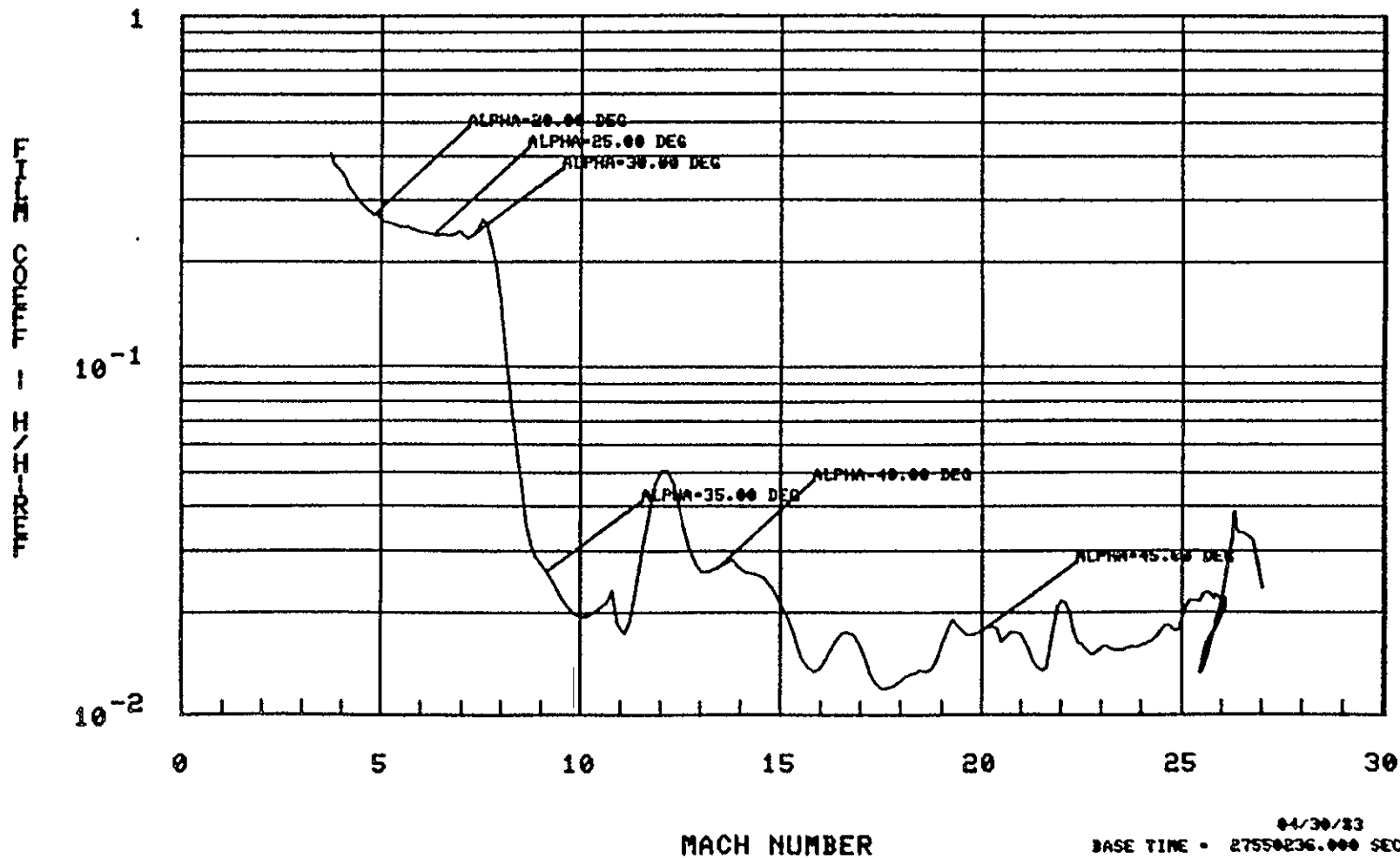


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B-381

# STS-2 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

U07T9492A/H-REF 200-1480 SEC

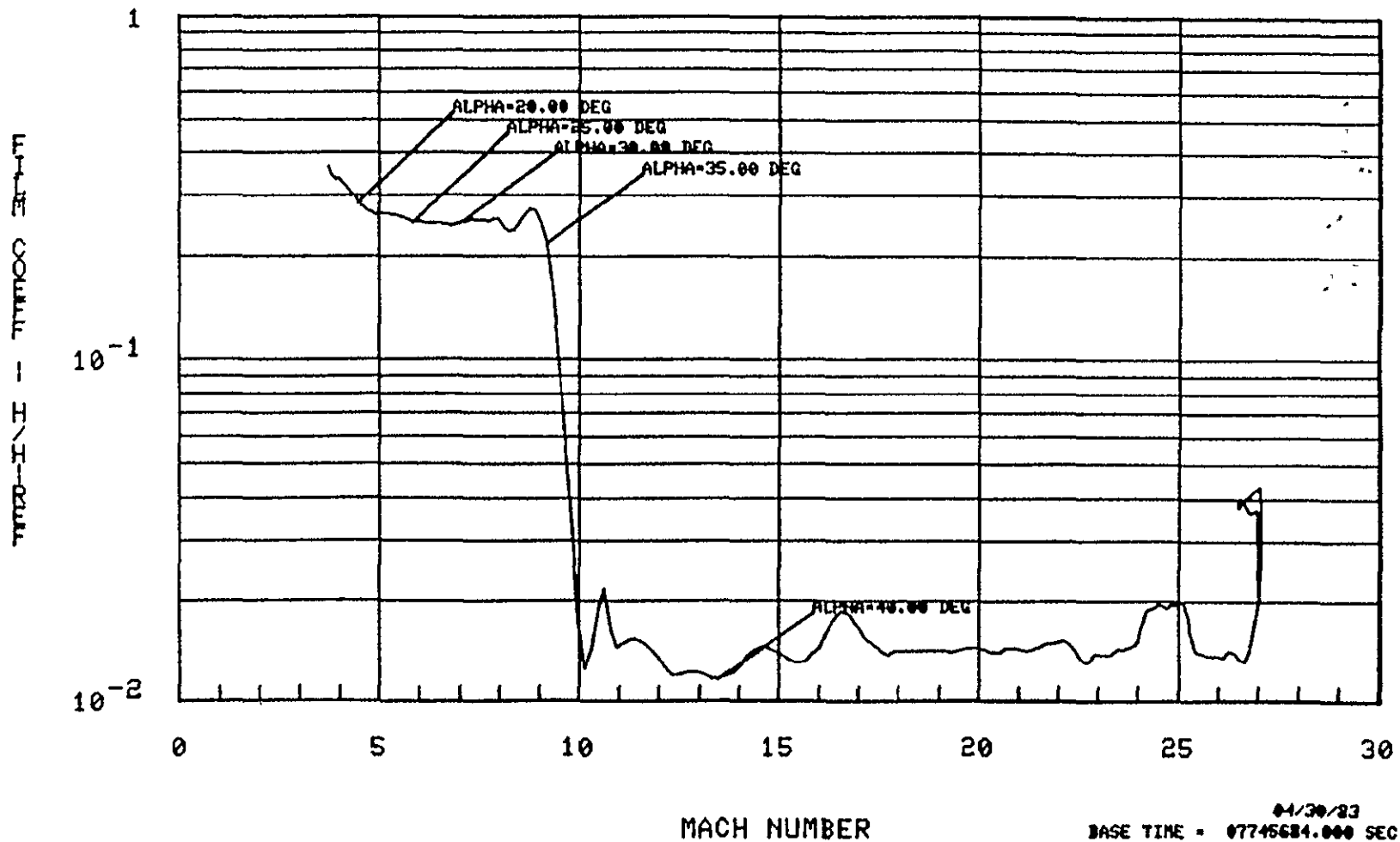


B-382

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U07T9492A/H-REF 200-1380 SEC

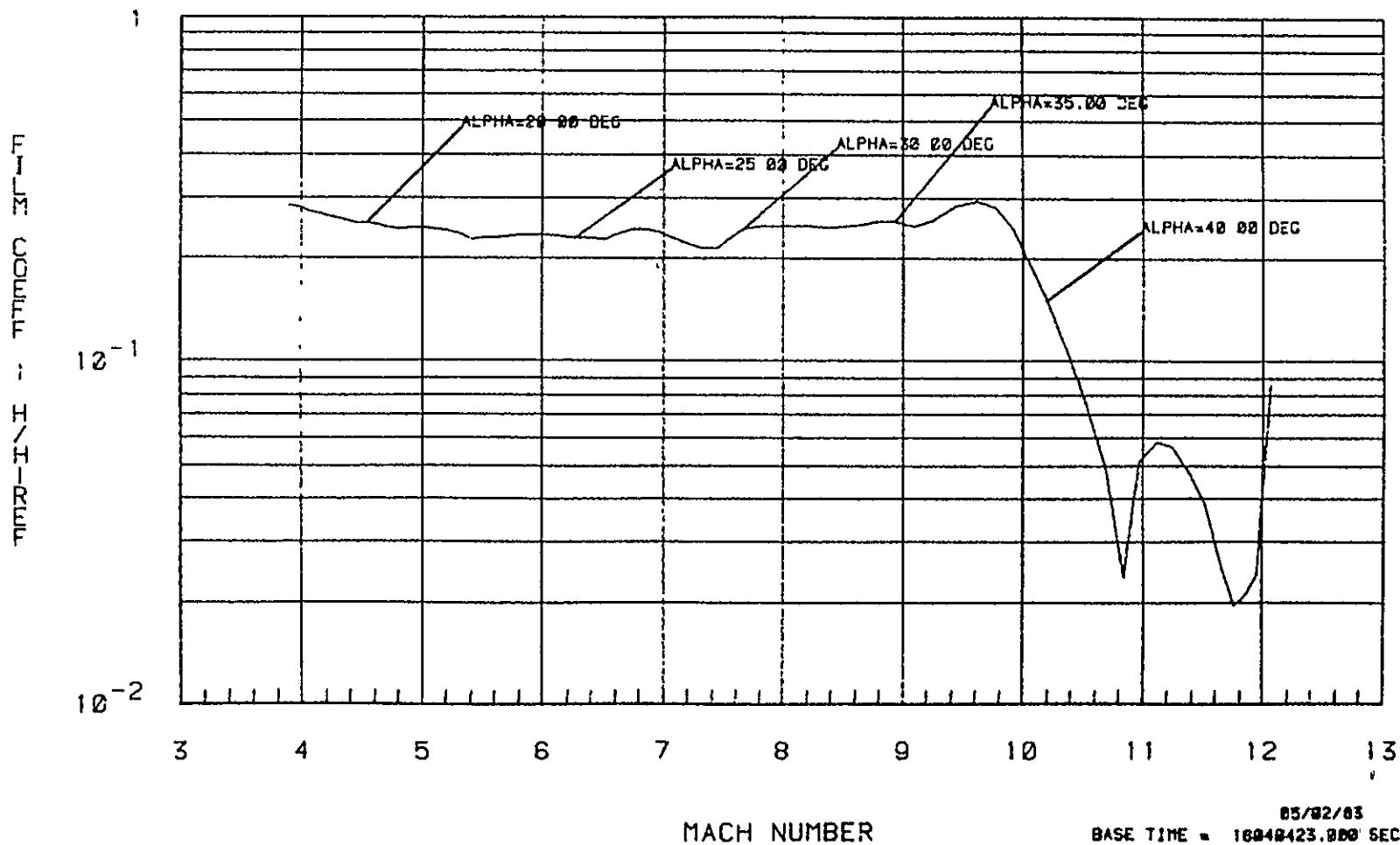


B-383

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# STS-4 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

———— V07T0402A/H-REF 065-1300 SEC



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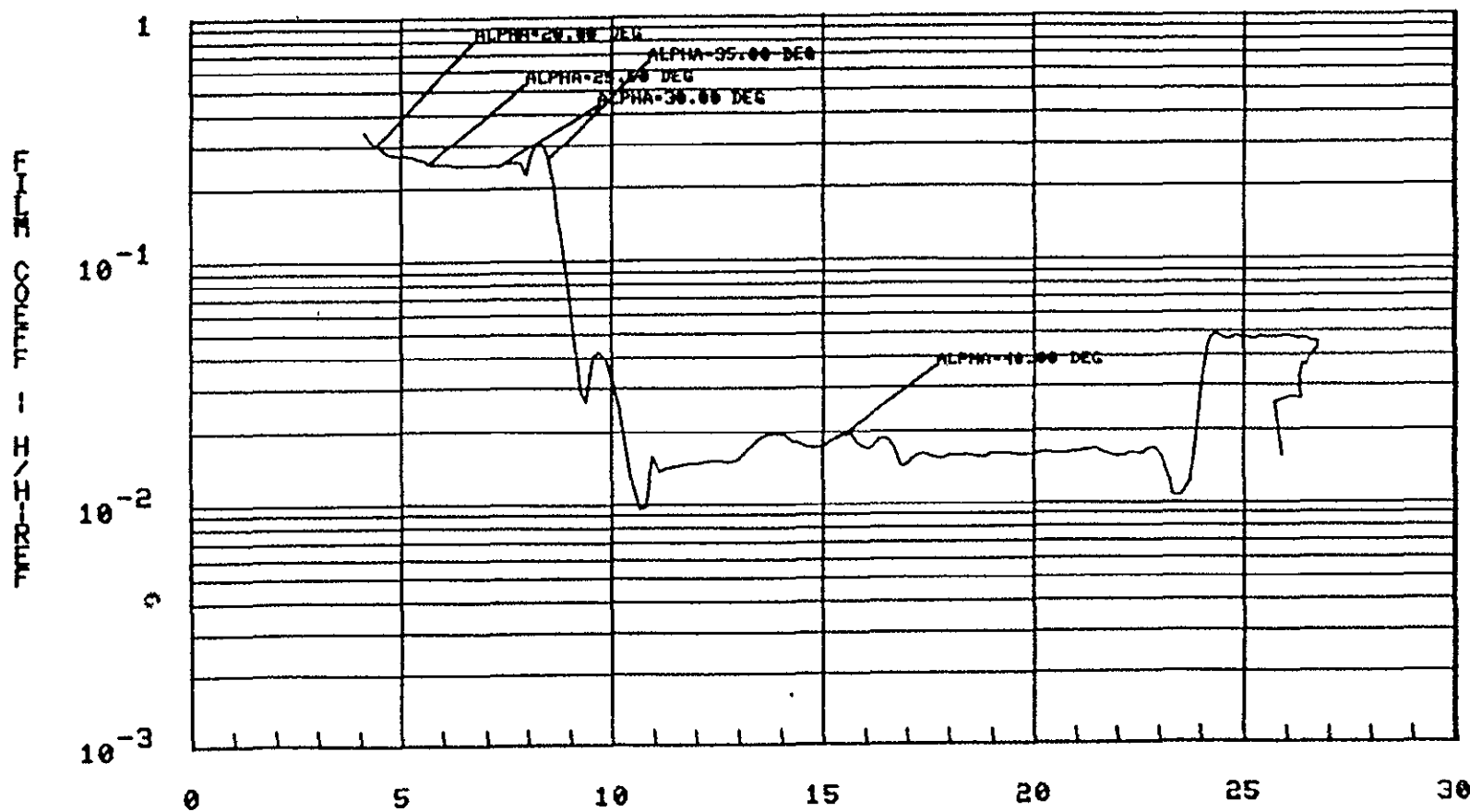
B-384

05/02/83  
BASE TIME = 10040423.000 SEC.



# STS-5 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

U07T9492A/H-REF 150-1350 SEC



B-385

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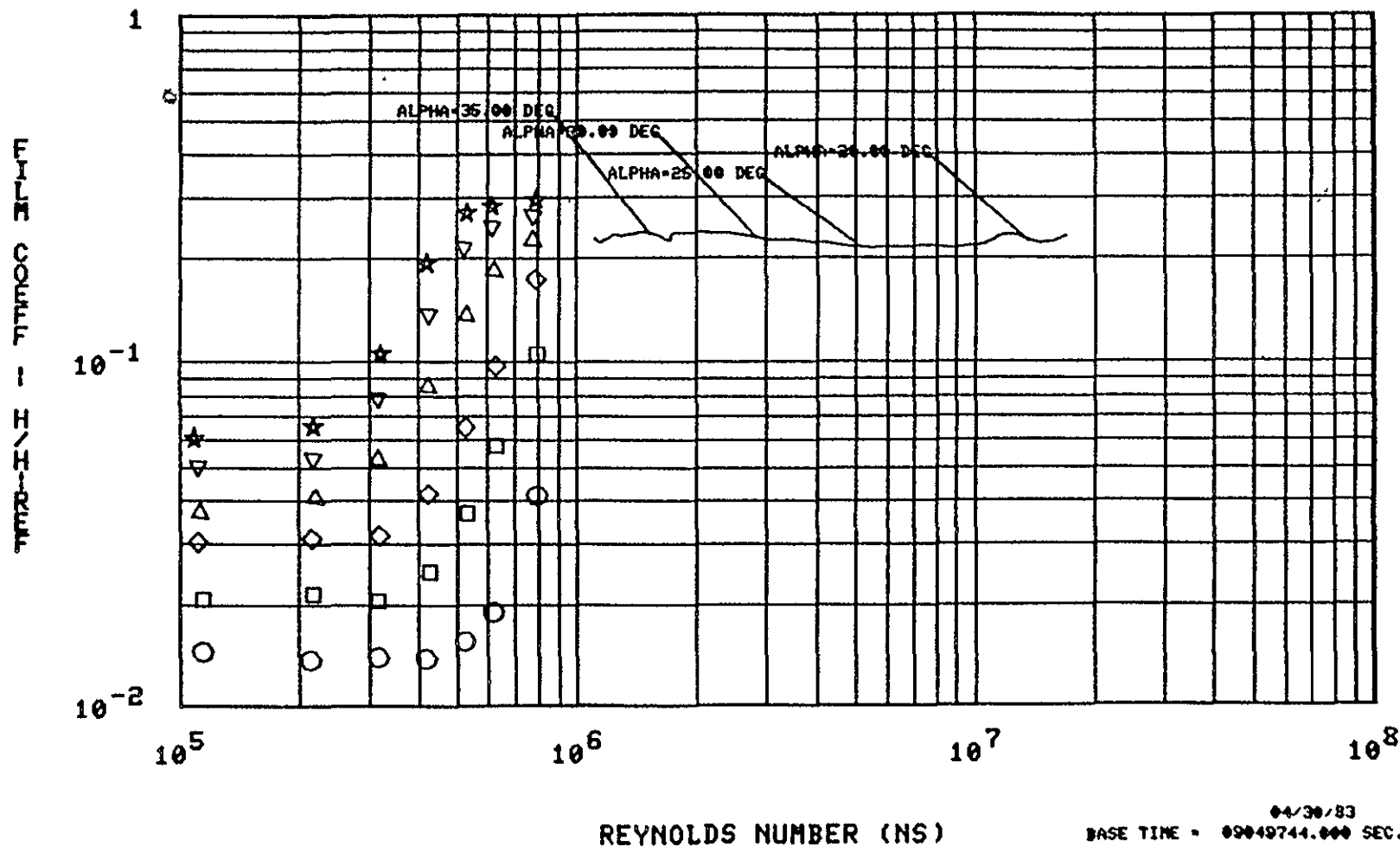
MACH NUMBER

04/28/83  
BASE TIME • 27698591.000 SEC.

# STS-1 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

- OH39 ALPHA = 20 DEGREES
- OH39 ALPHA = 25 DEGREES
- ◇ OH39 ALPHA = 30 DEGREES
- △ OH39 ALPHA = 35 DEGREES
- ▽ OH39 ALPHA = 40 DEGREES
- ★ OH39 ALPHA = 45 DEGREES

U07T9492A/H-REF 1065-1460 SEC



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# STS-2 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

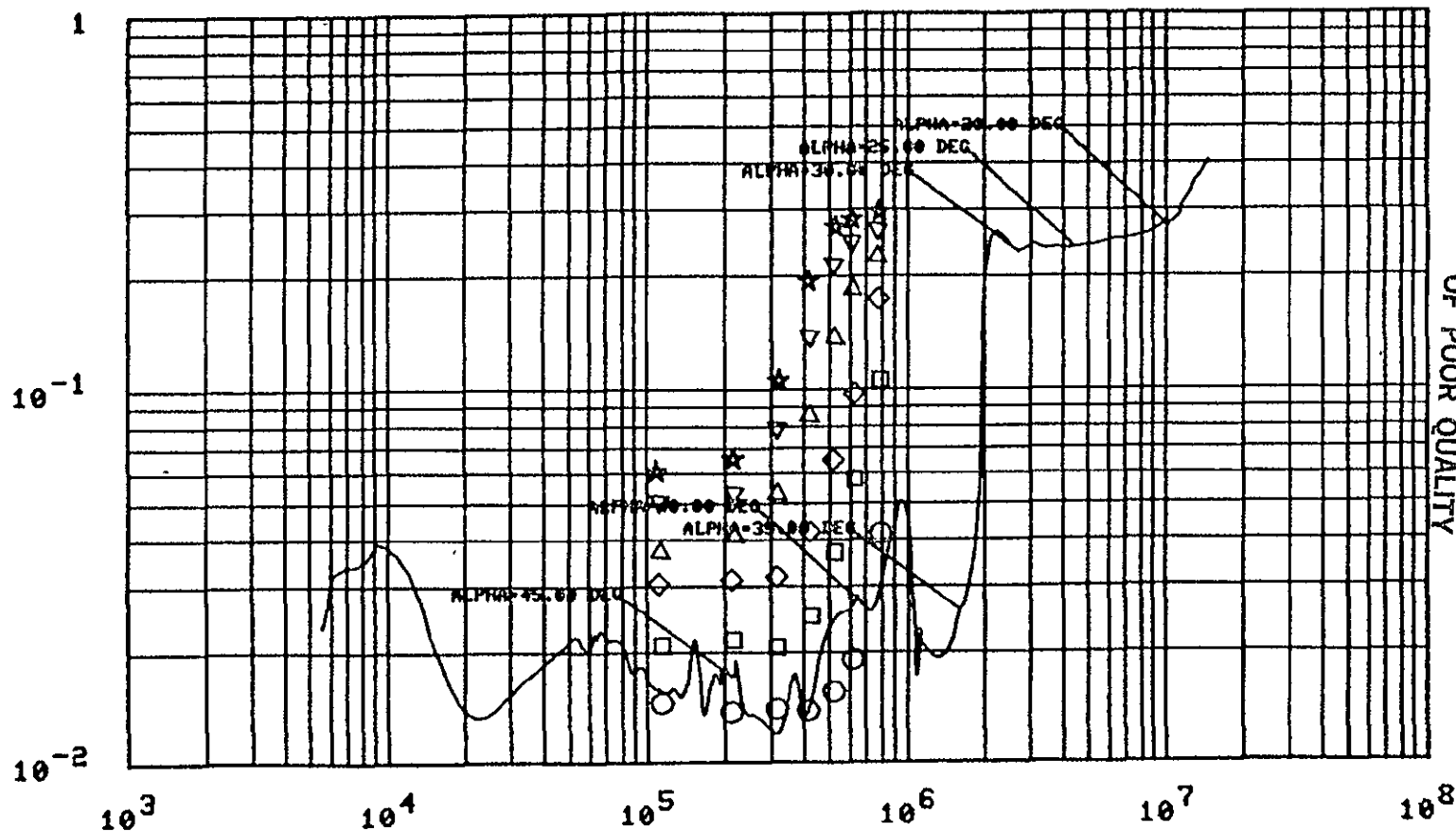
○  
□  
◇  
△  
▽  
★

OH39 ALPHA = 20 DEGREES  
OH39 ALPHA = 25 DEGREES  
OH39 ALPHA = 30 DEGREES  
OH39 ALPHA = 35 DEGREES  
OH39 ALPHA = 40 DEGREES  
OH39 ALPHA = 45 DEGREES

U07T9492A/H-REF 200-1480 SEC

LINE QUALITY - H/H-QUAL

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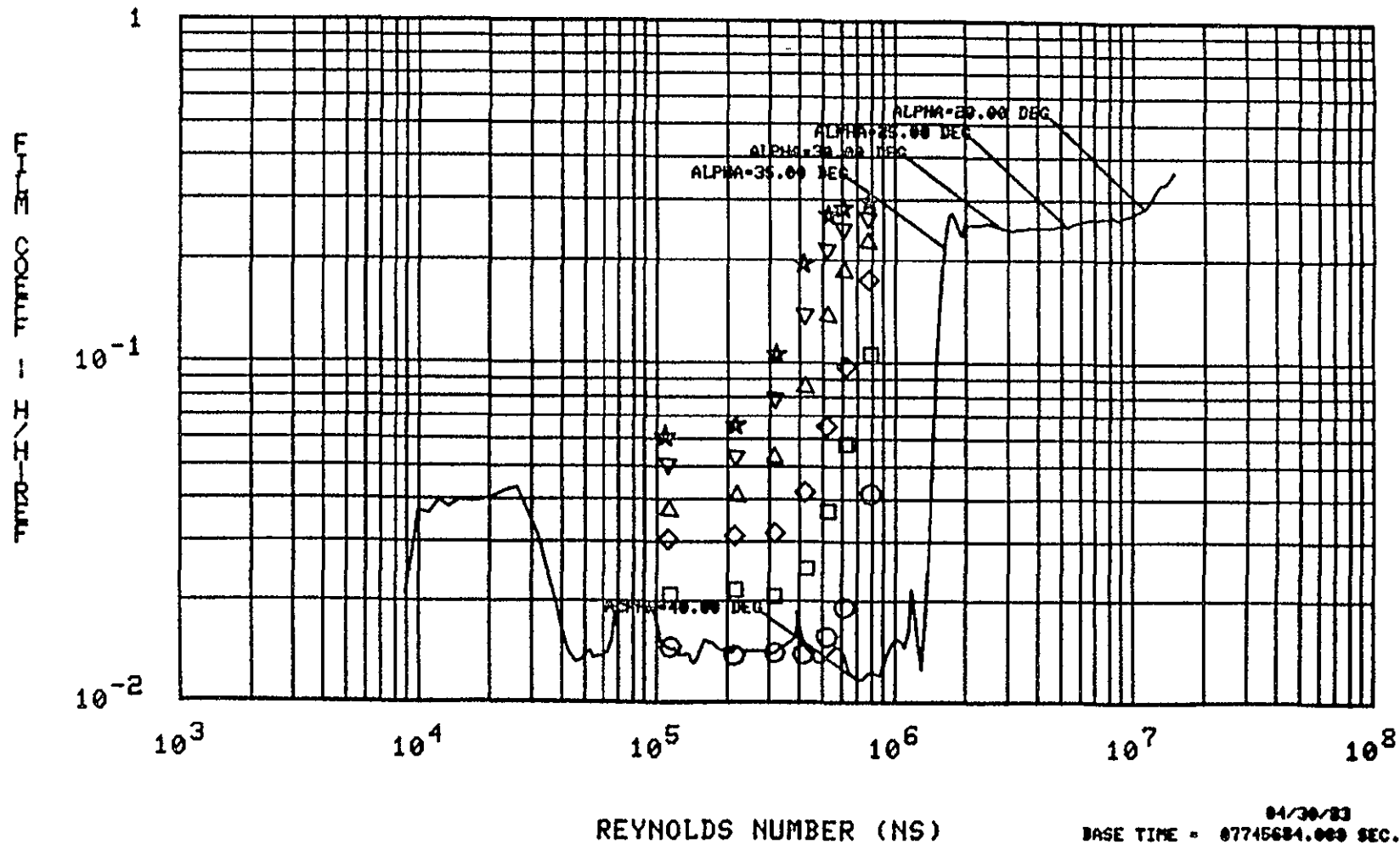
REYNOLDS NUMBER (NS)

04/30/83  
BASE TIME - 27550236.000 SEC.

# STS-3 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISON

○ OH39 ALPHA = 20 DEGREES  
 □ OH39 ALPHA = 25 DEGREES  
 ◇ OH39 ALPHA = 30 DEGREES  
 △ OH39 ALPHA = 35 DEGREES  
 ▽ OH39 ALPHA = 40 DEGREES  
 ★ OH39 ALPHA = 45 DEGREES

U07T9492A/H-REF 200-1380 SEC



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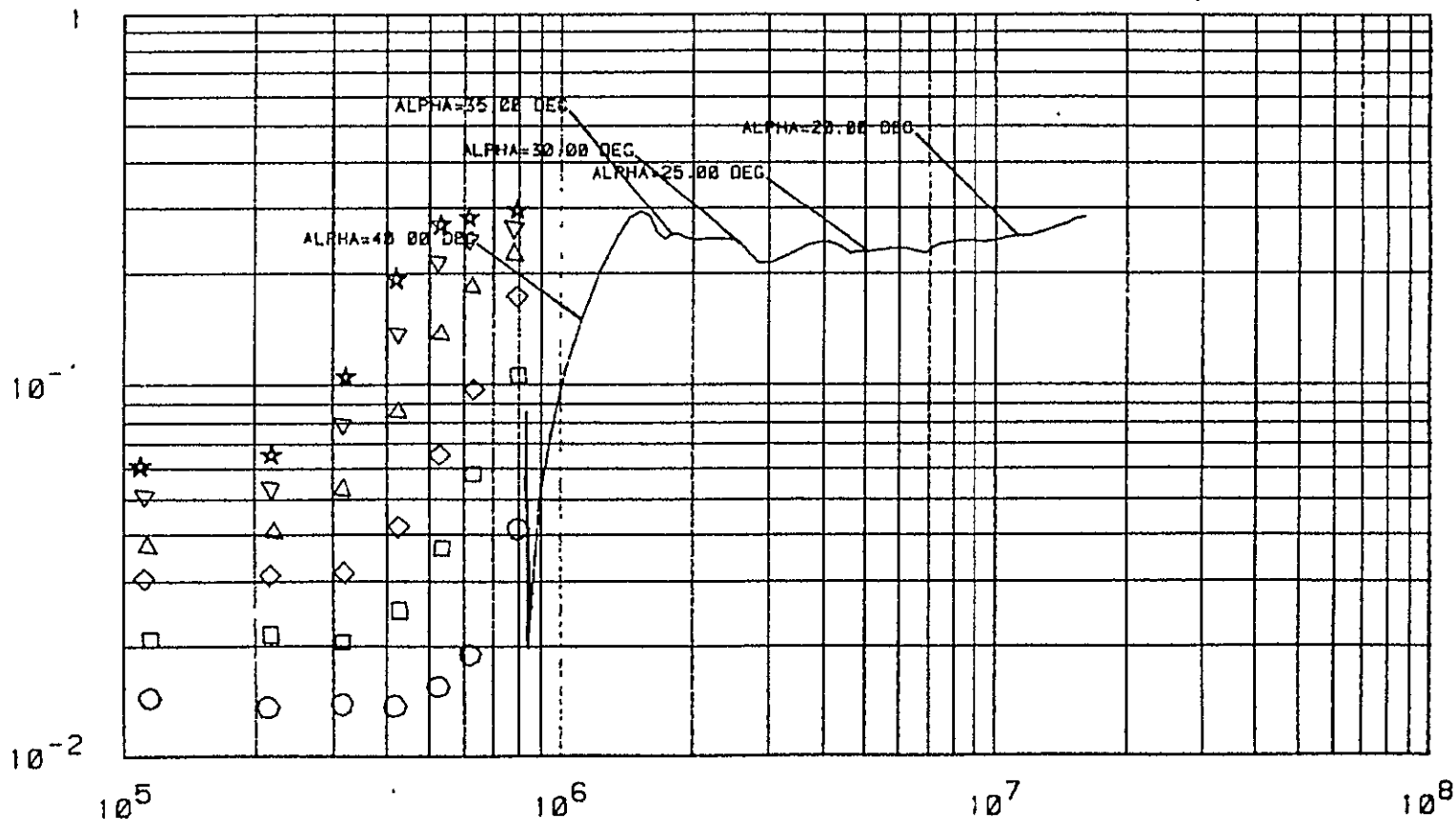
# STS-4 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

○  
□  
◇  
△  
▽  
★

OH30 ALPHA = 20 DEGREES  
OH30 ALPHA = 25 DEGREES  
OH30 ALPHA = 30 DEGREES  
OH30 ALPHA = 35 DEGREES  
OH30 ALPHA = 40 DEGREES  
OH30 ALPHA = 45 DEGREES

V07T0402A/H-REF 065-1300 SEC

LINE COEFF. - T/I-0.011



B-389

REYNOLDS NUMBER (NS)

05/02/83  
BASE TIME = 16040423 000 SEC.

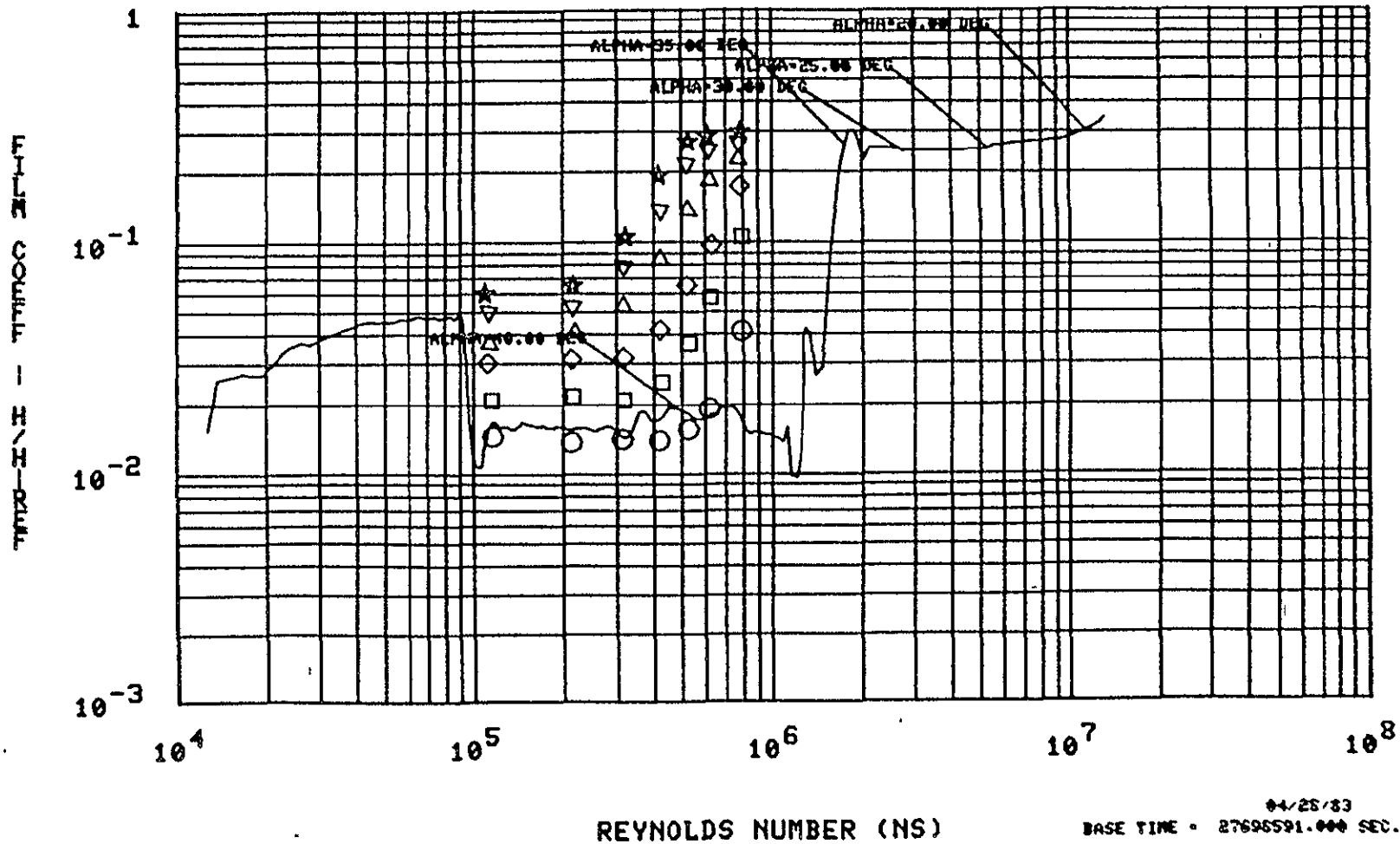
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# STS-5 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

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△  
▽  
★

OH39 ALPHA • 20 DEGREES  
OH39 ALPHA • 25 DEGREES  
OH39 ALPHA • 30 DEGREES  
OH39 ALPHA • 35 DEGREES  
OH39 ALPHA • 40 DEGREES  
OH39 ALPHA • 45 DEGREES

U07T9492A/H-REF 150-1350 SEC

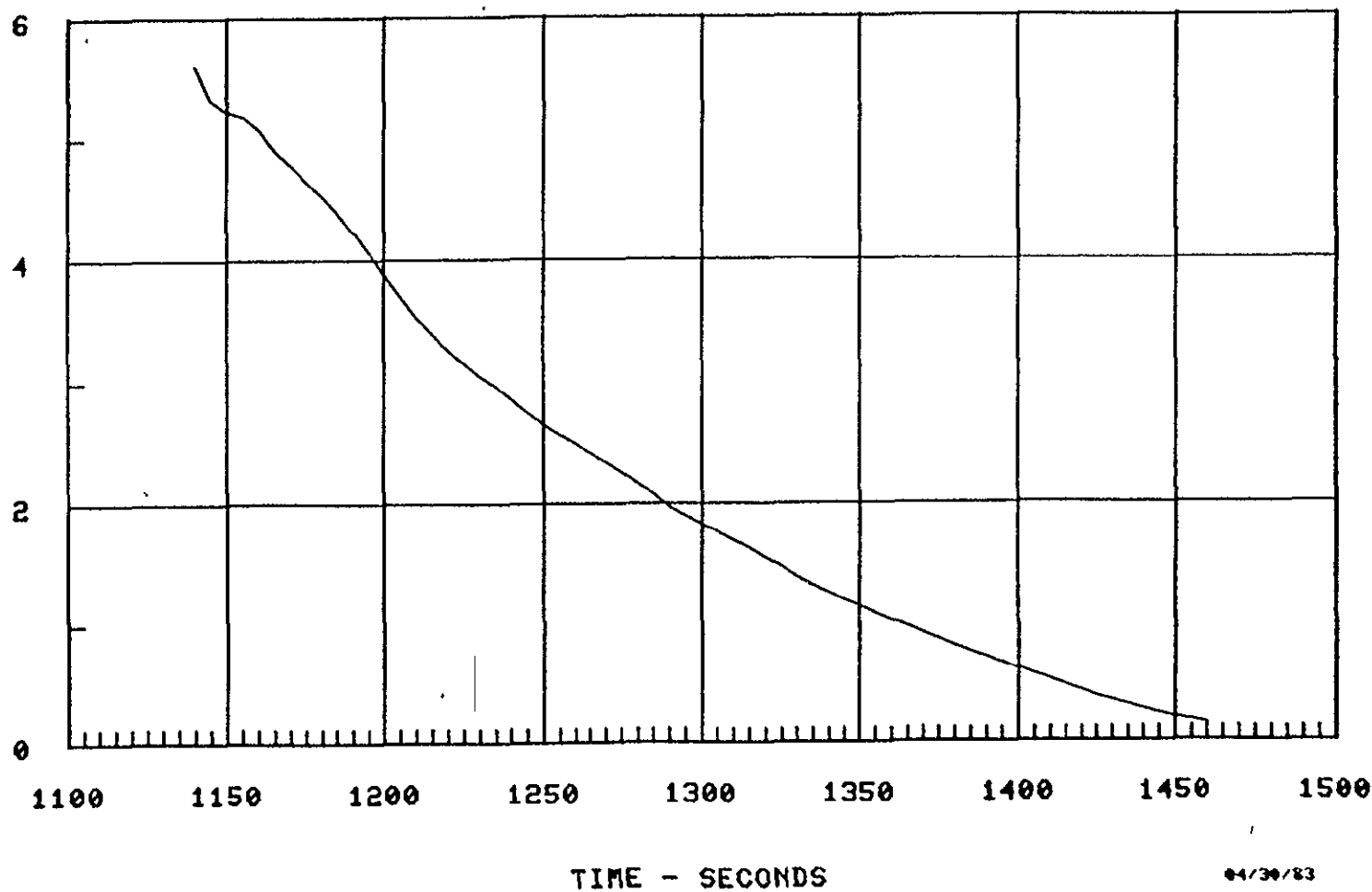


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U07T9492A

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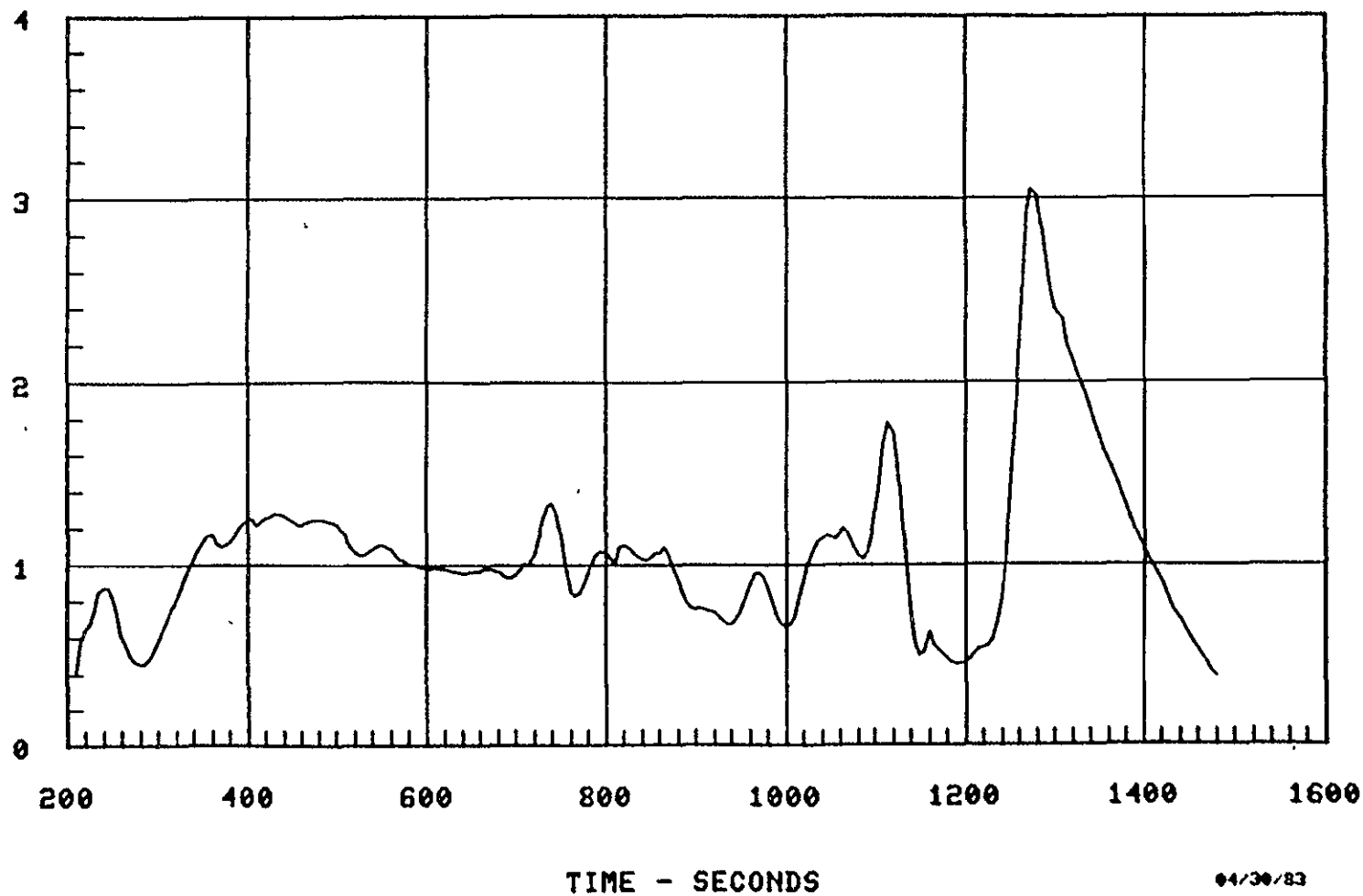


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U07T9492A

INDICED RATE - ROLLING - SNU



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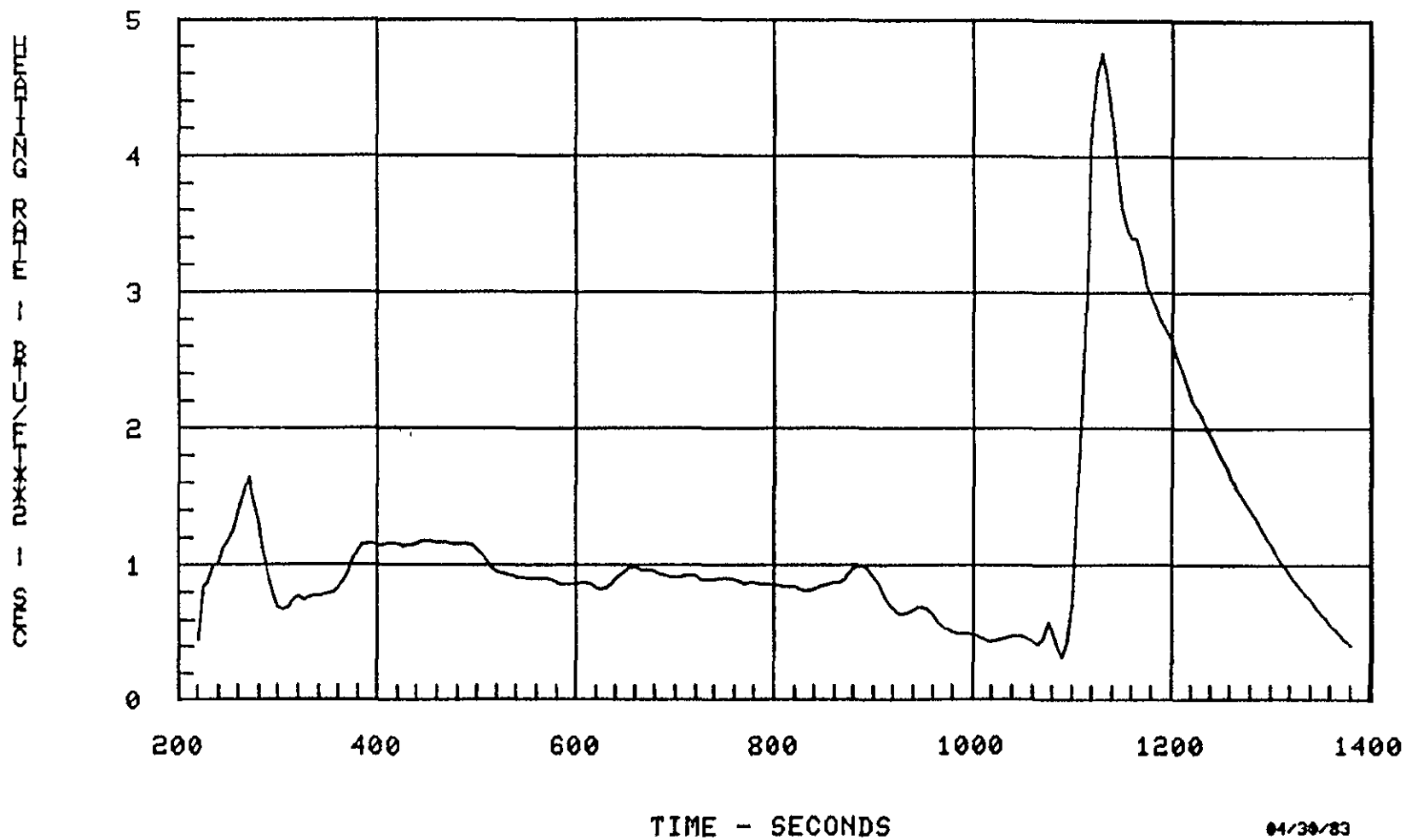
B-392

04/30/83



## STS-3 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

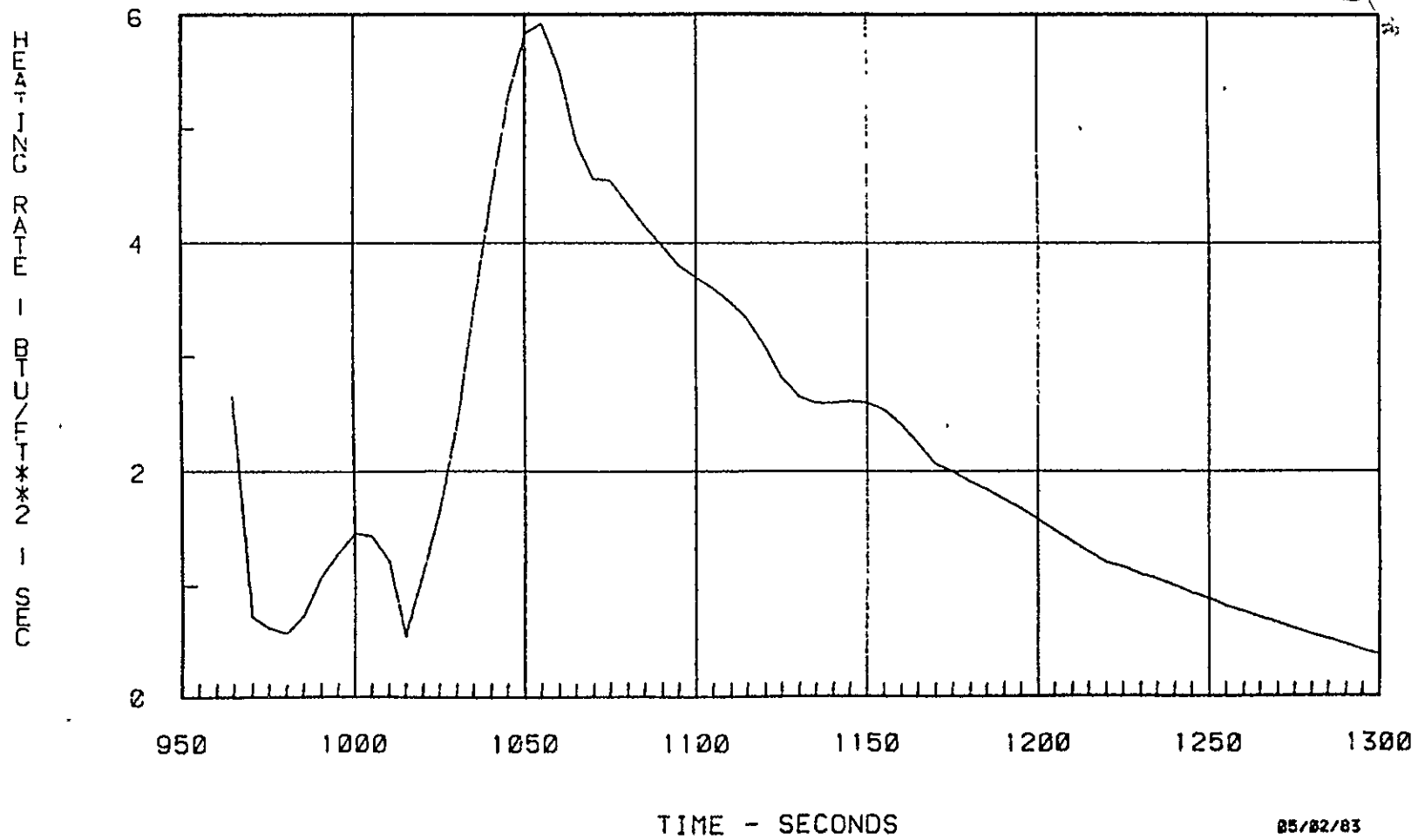
U07T9492A



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# STS-4 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

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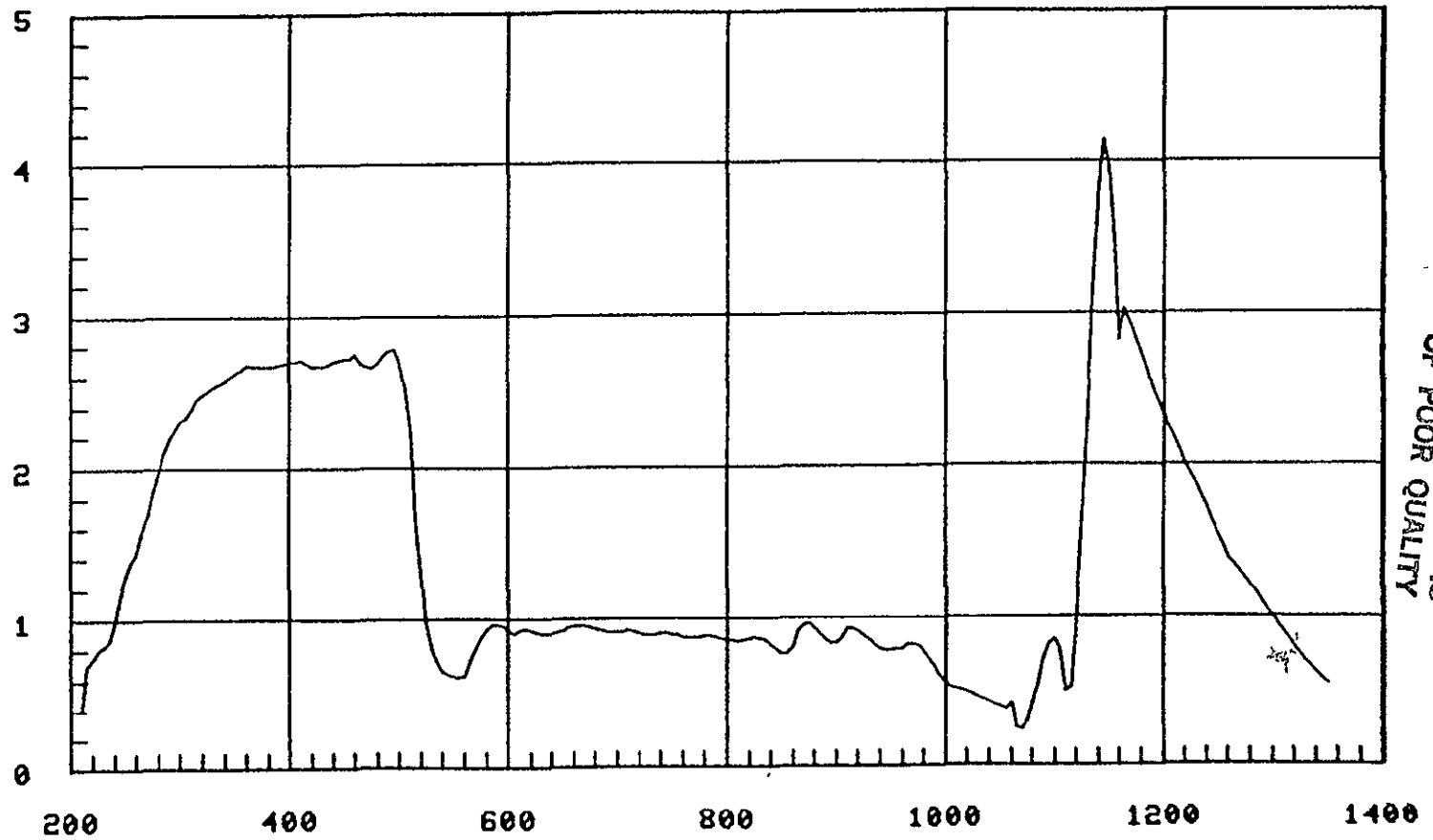
B-394

05/02/83

# STS-5 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

U07T9492A

INSTRUMENTS - ACCELERATION - G



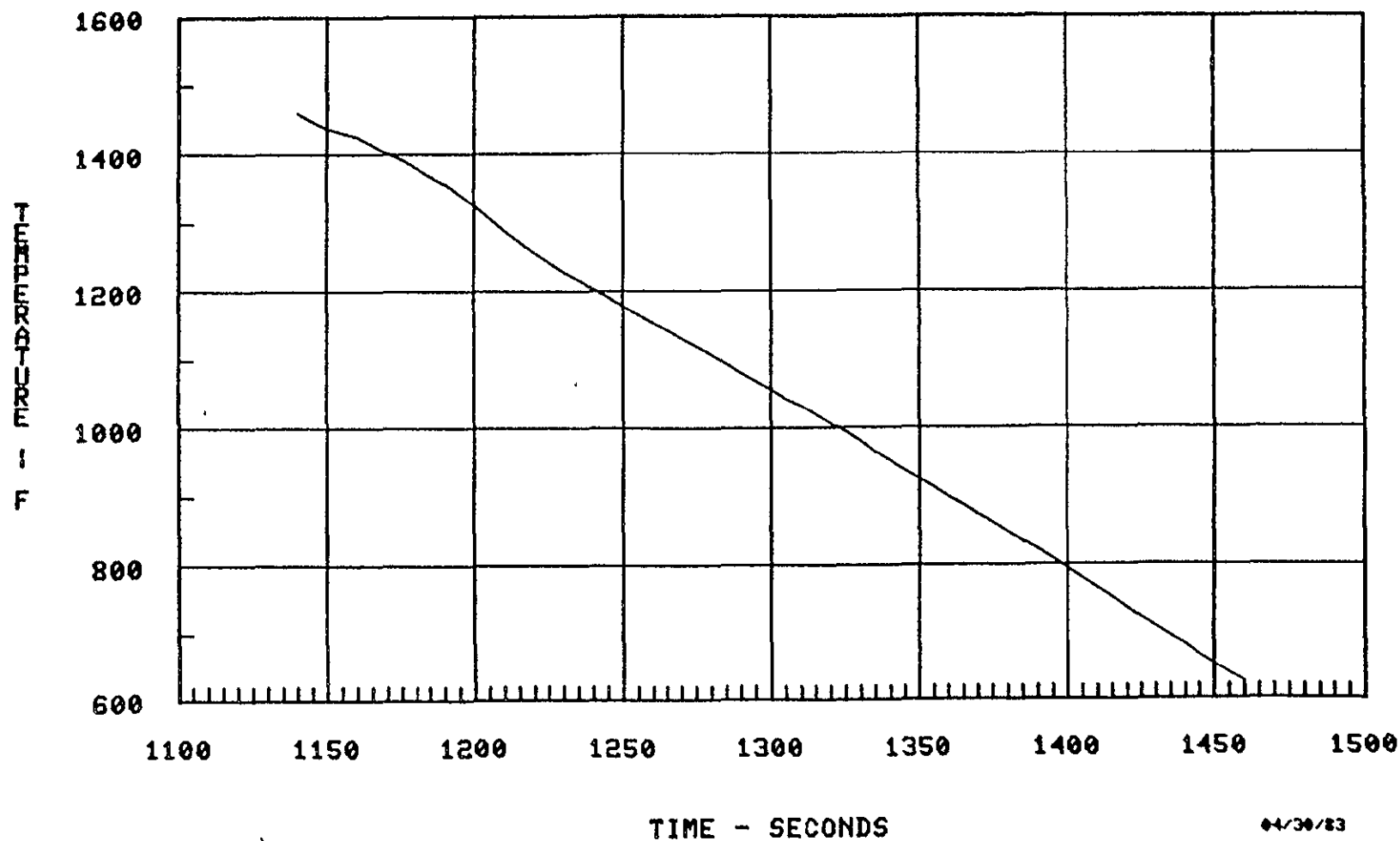
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TIME - SECONDS

04/25-83

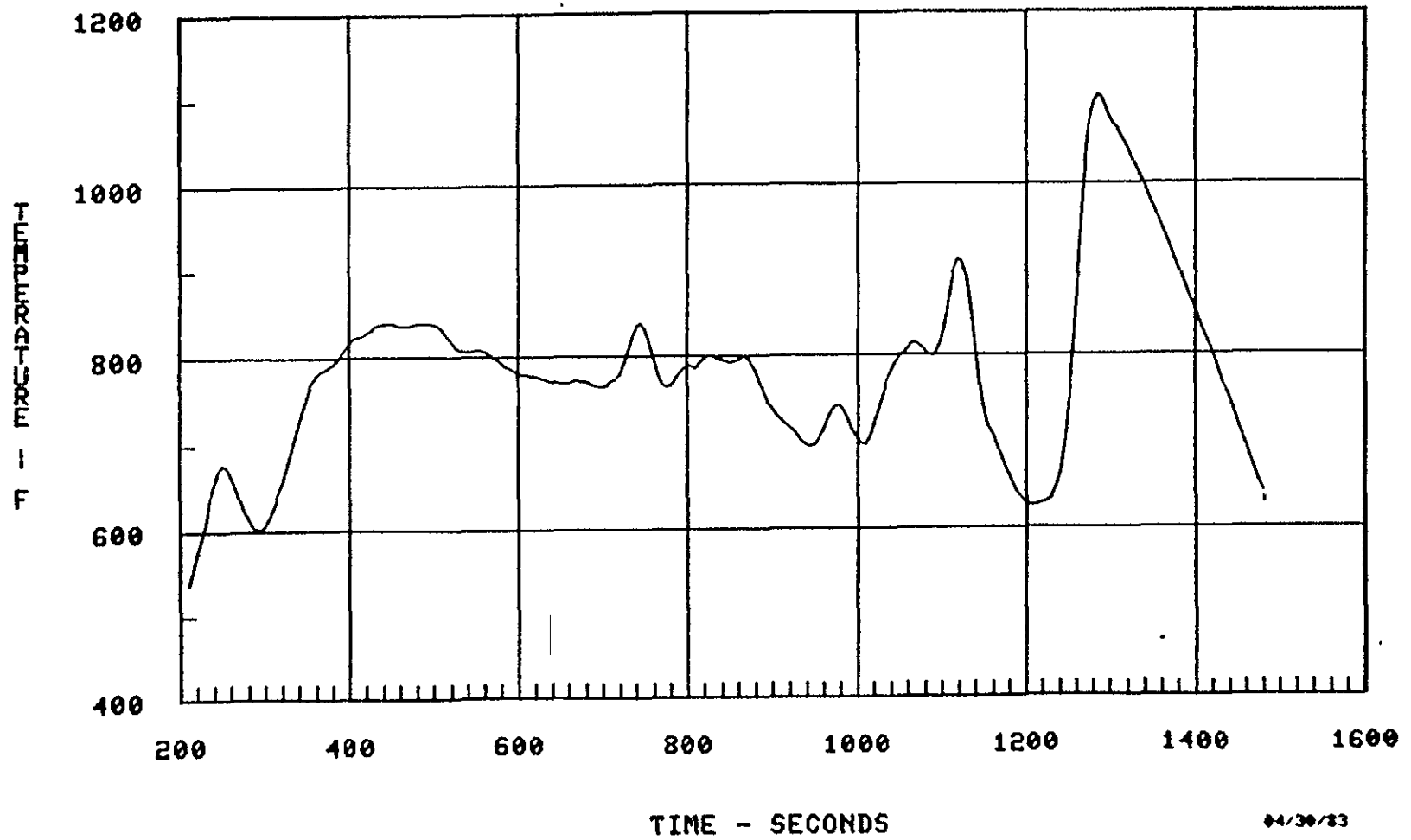
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U87T9492A



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U07T9492A



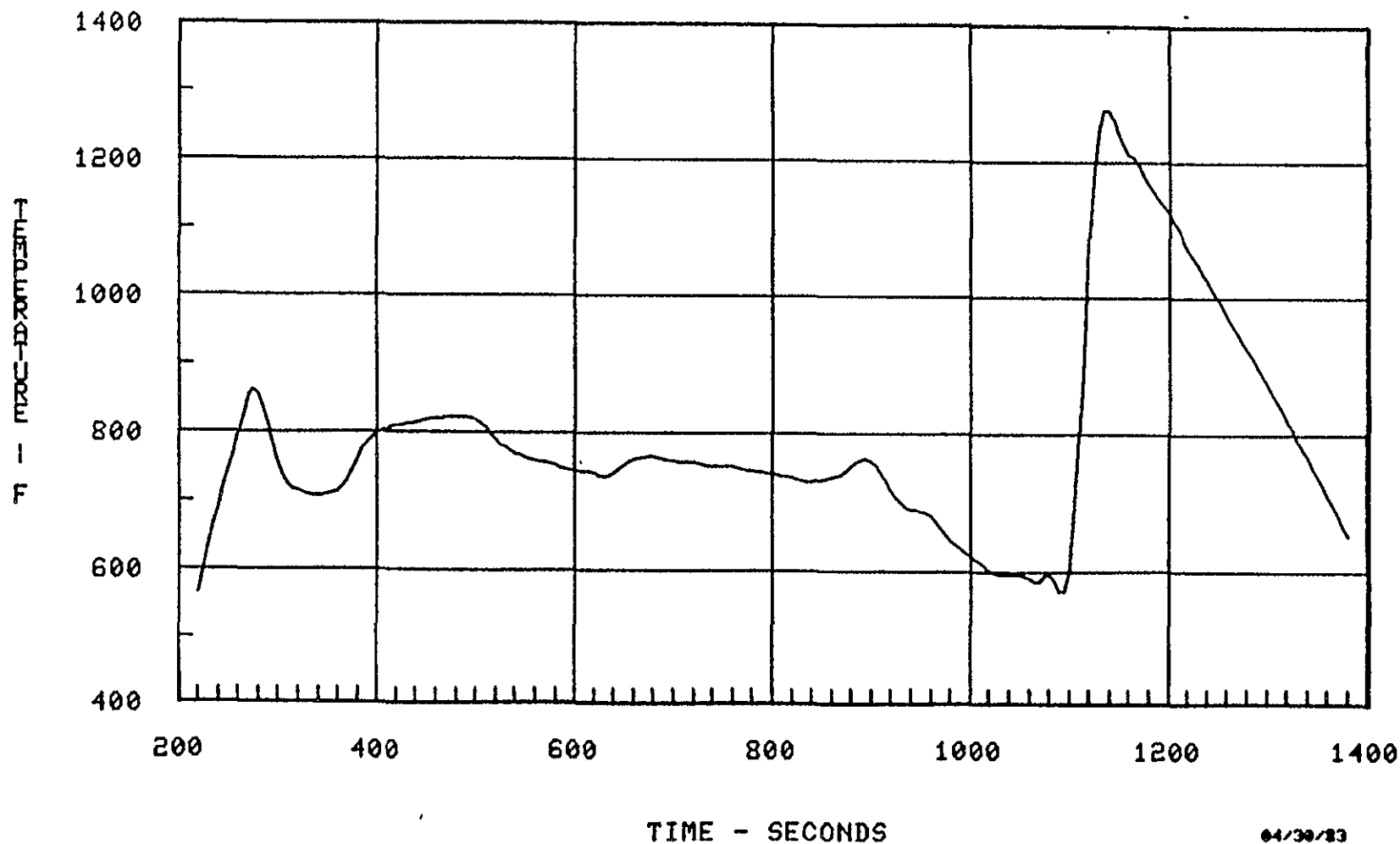
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B-397

04/30/83

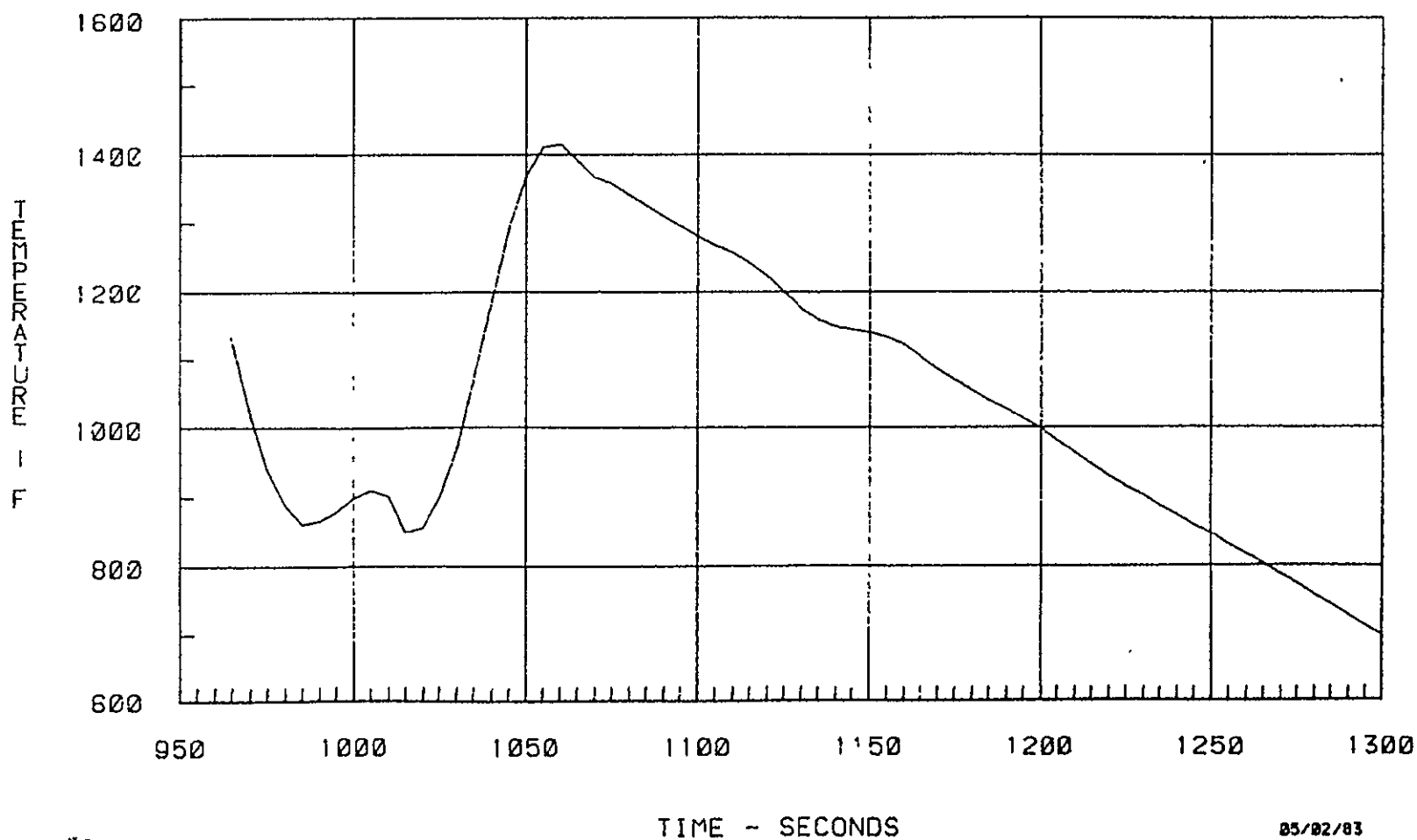
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V07T9492A



STS-4 (107 FT LENGTH CL X/L=0.99) FLIGHT PARAMETER COMPARISO

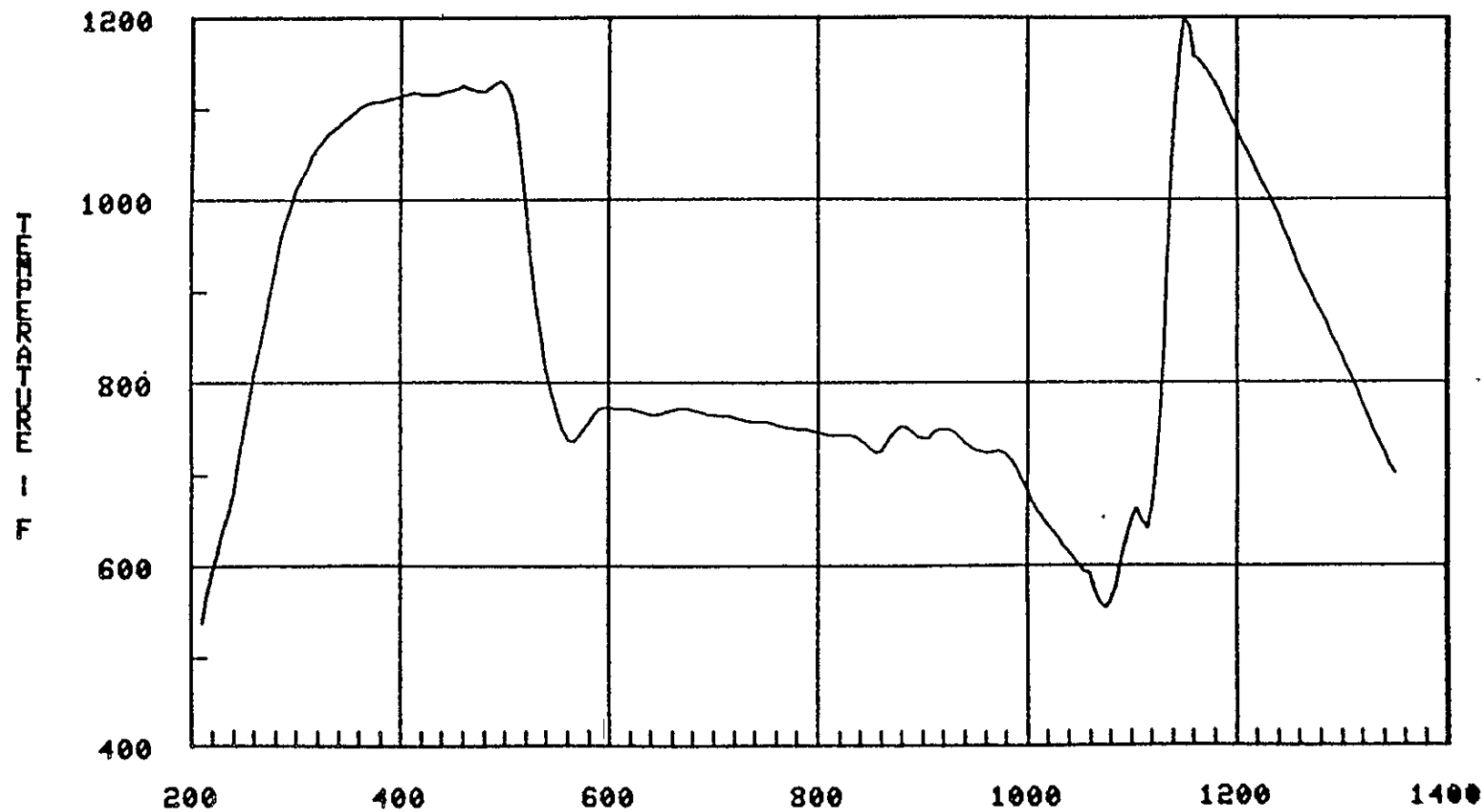
—— V07T0402A



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U07T9492A



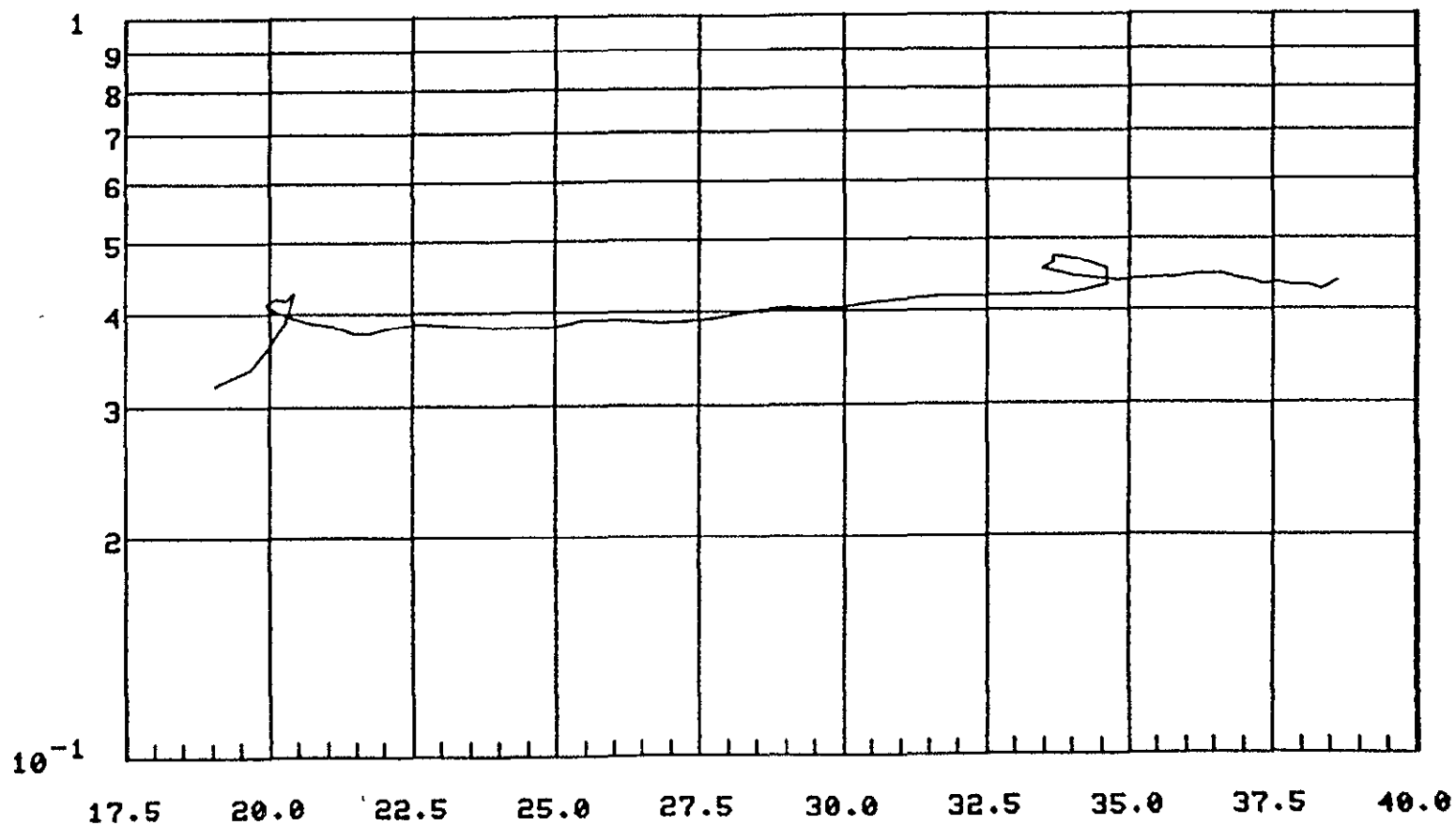
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04/28/53



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U07T9500A/H-REF 1065-1460 SEC



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ANGLE-OF-ATTACK - DEG

04/30/83  
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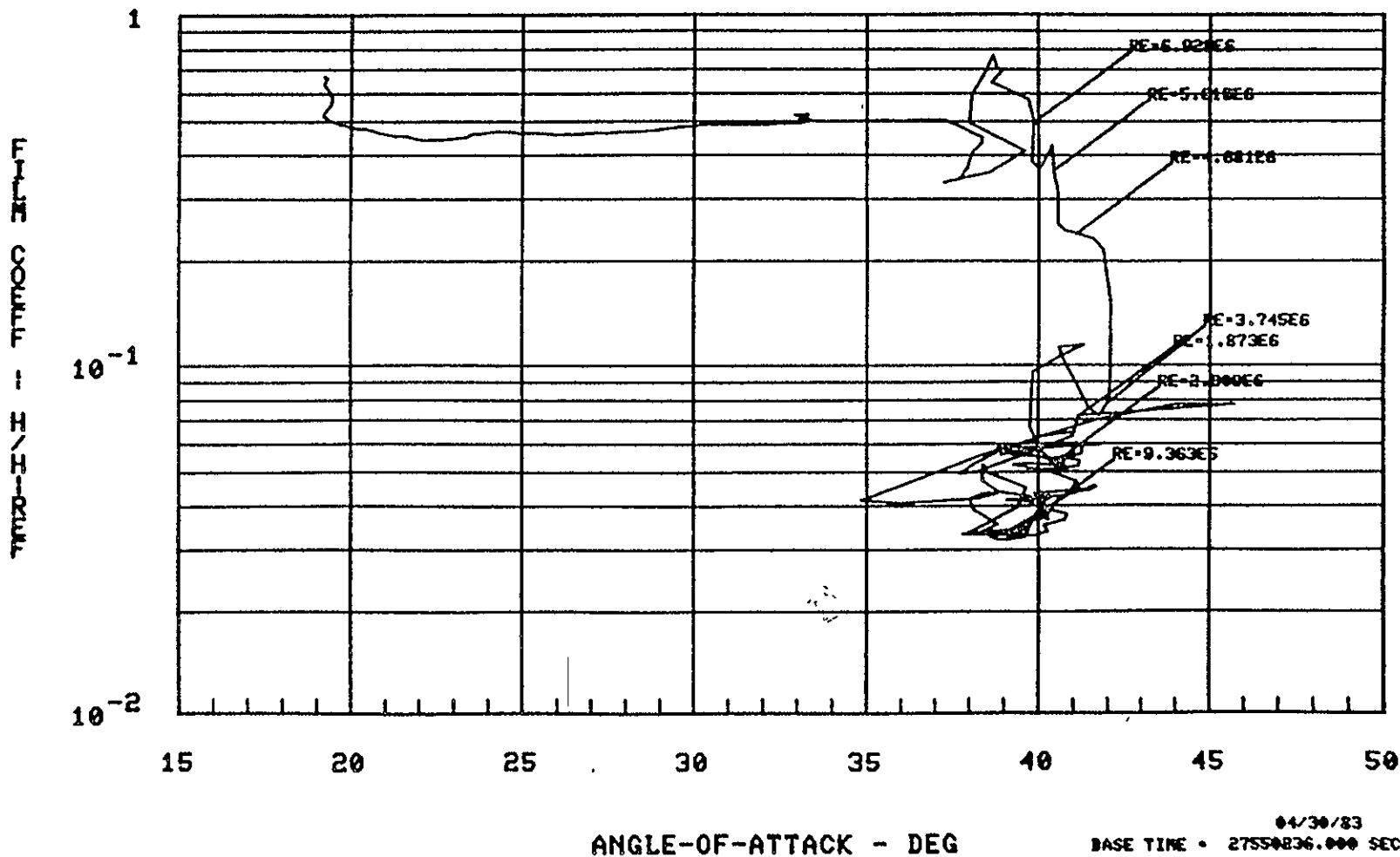
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C-6

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U07T9500A/H-REF 200-1480 SEC



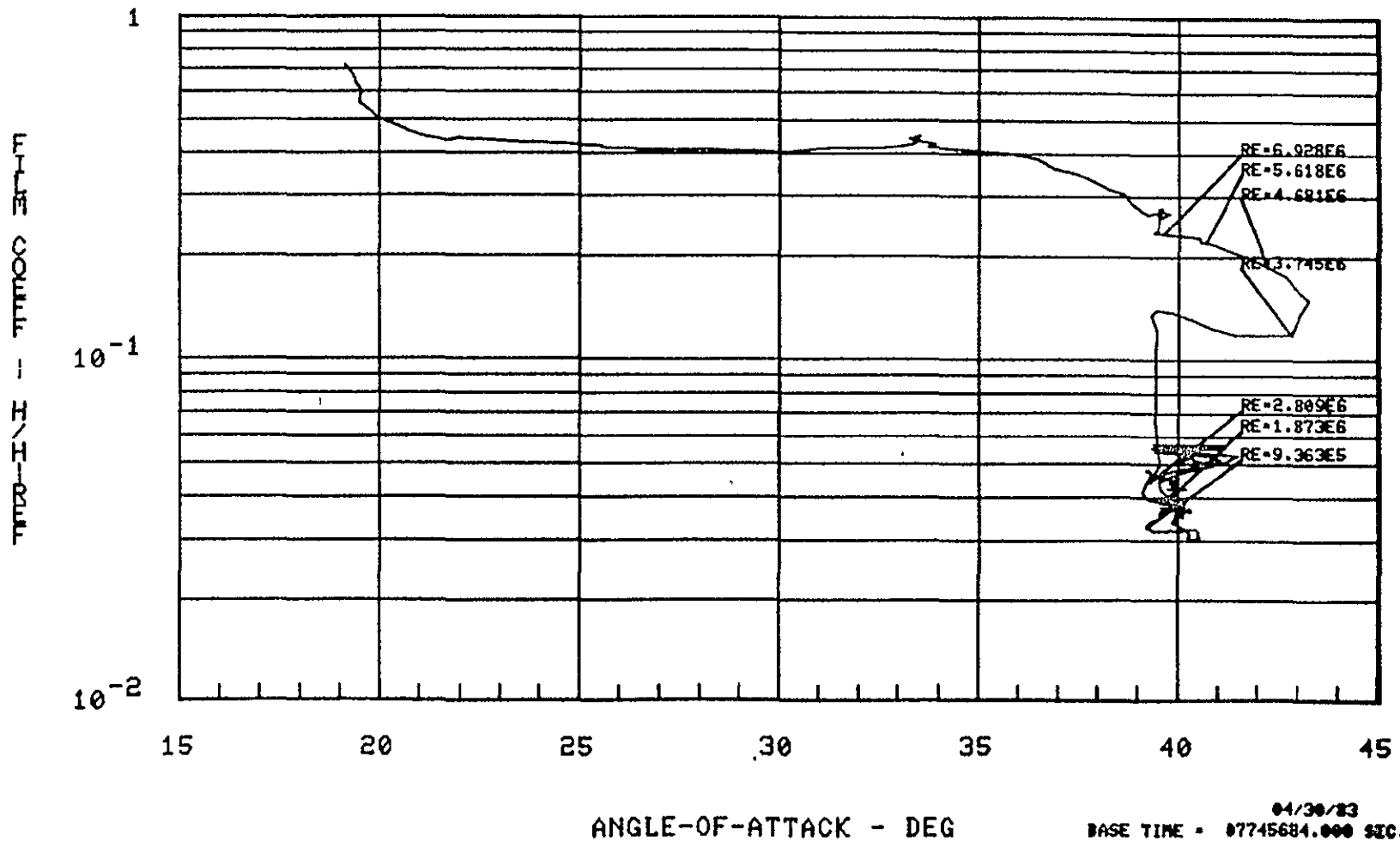
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B-402

26

# STS-3 (107 FT LENGTH CL $\gamma/L=1.02$ ) FLIGHT PARAMETER COMPARISON

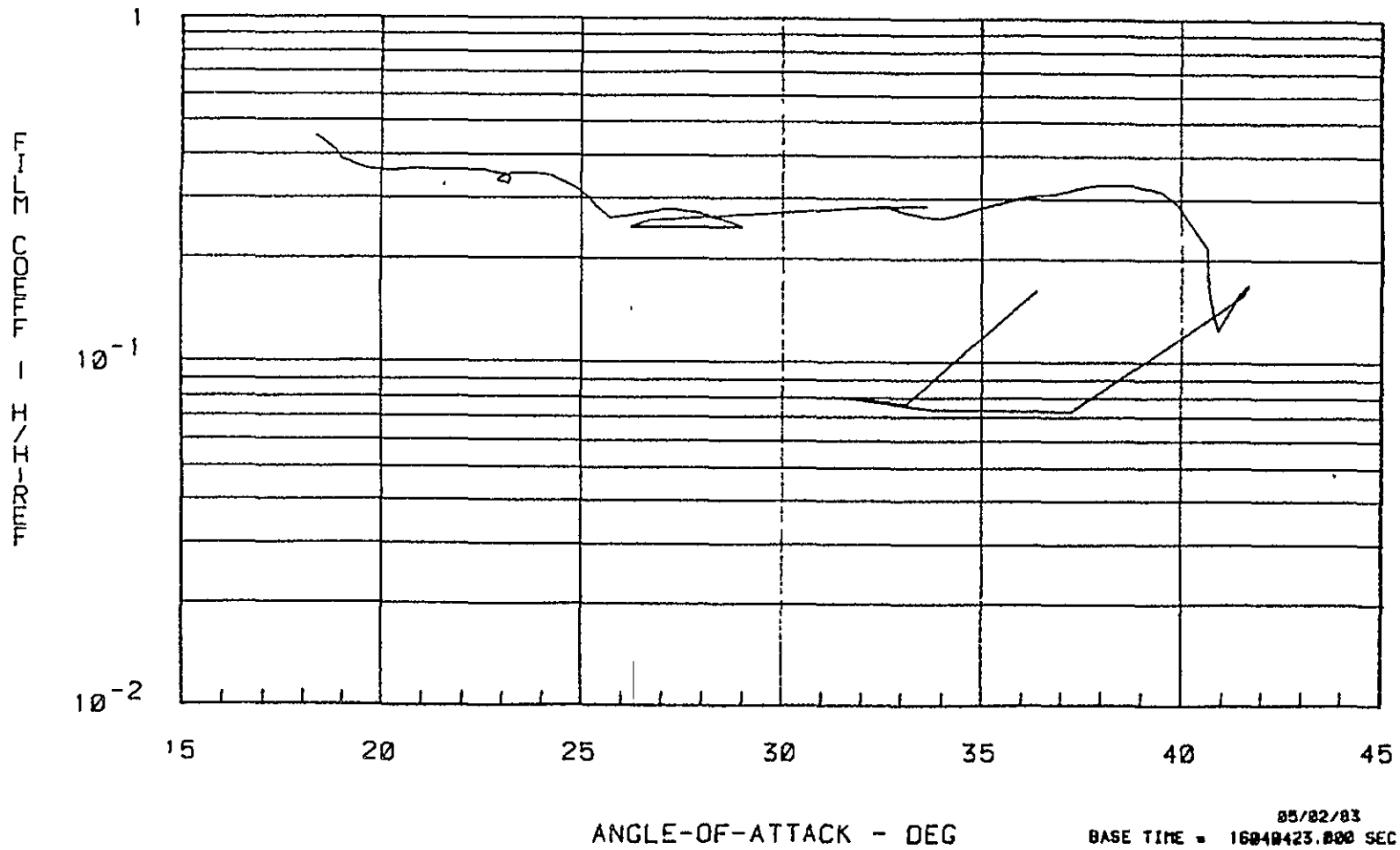
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VB7T0500A/H-REF 065-1300 SEC



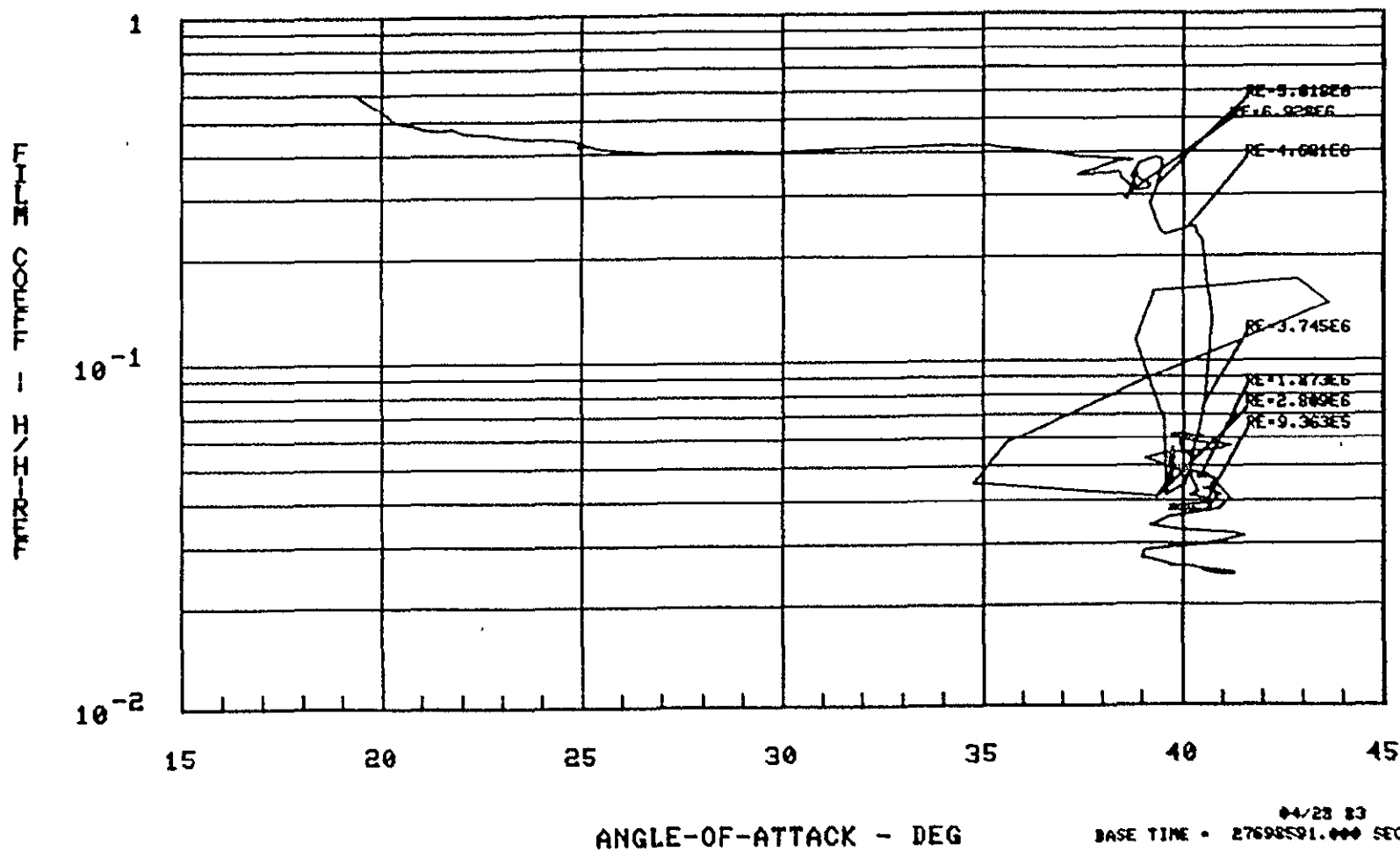
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85/82/83  
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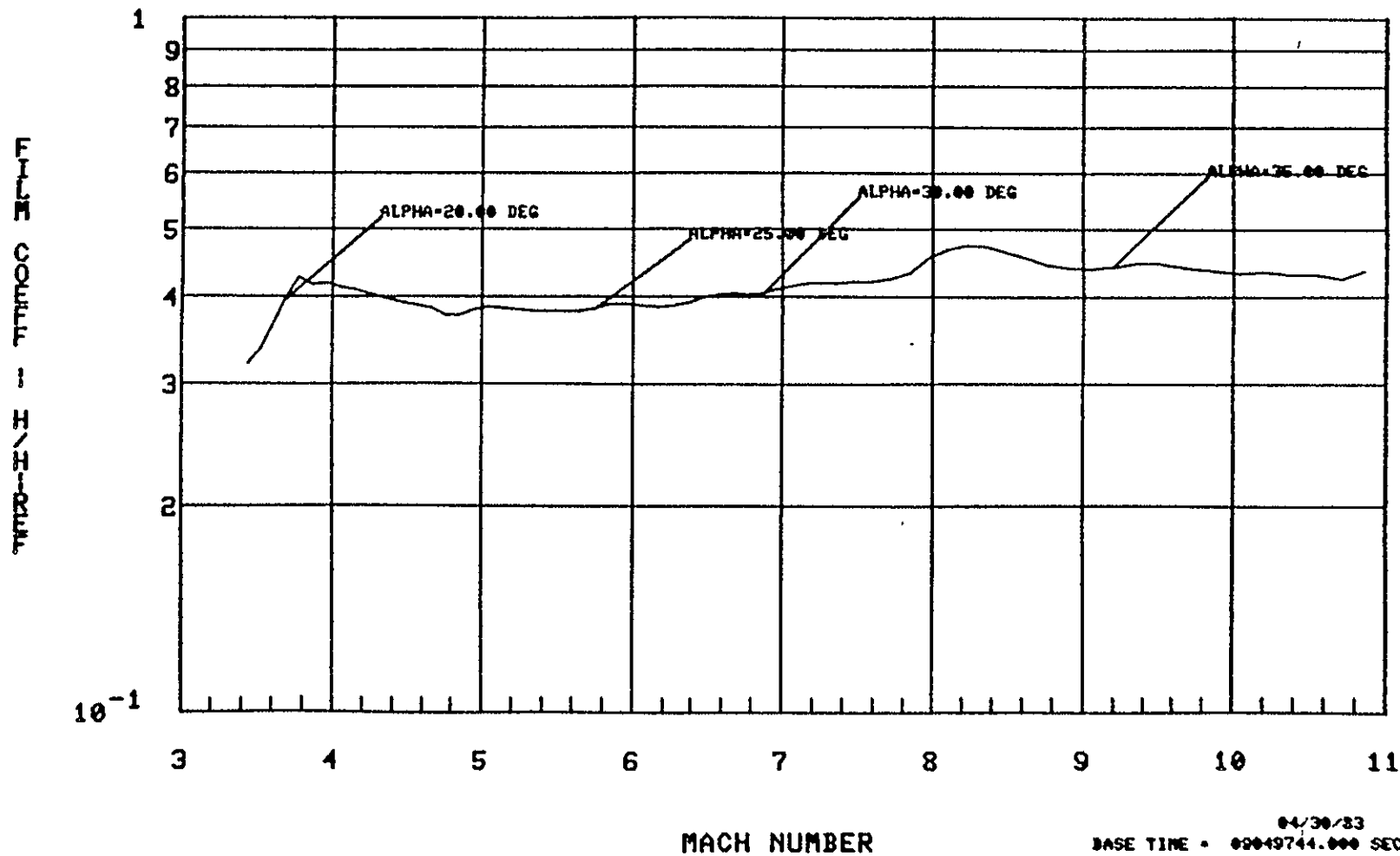
U07T9500A/H-REF 150-1350 SEC



B-405

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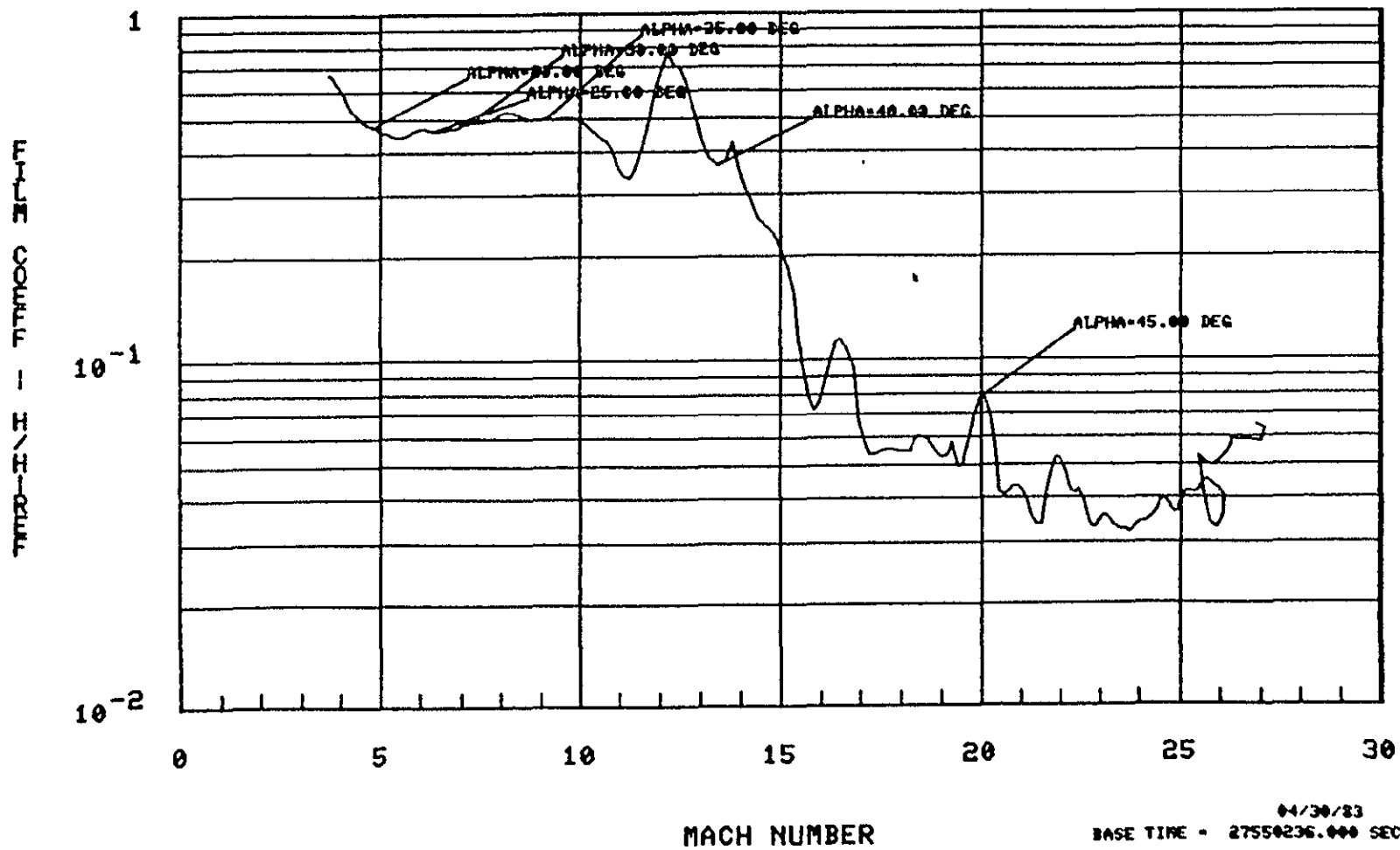
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U07T9500A/H-REF 200-1480 SEC

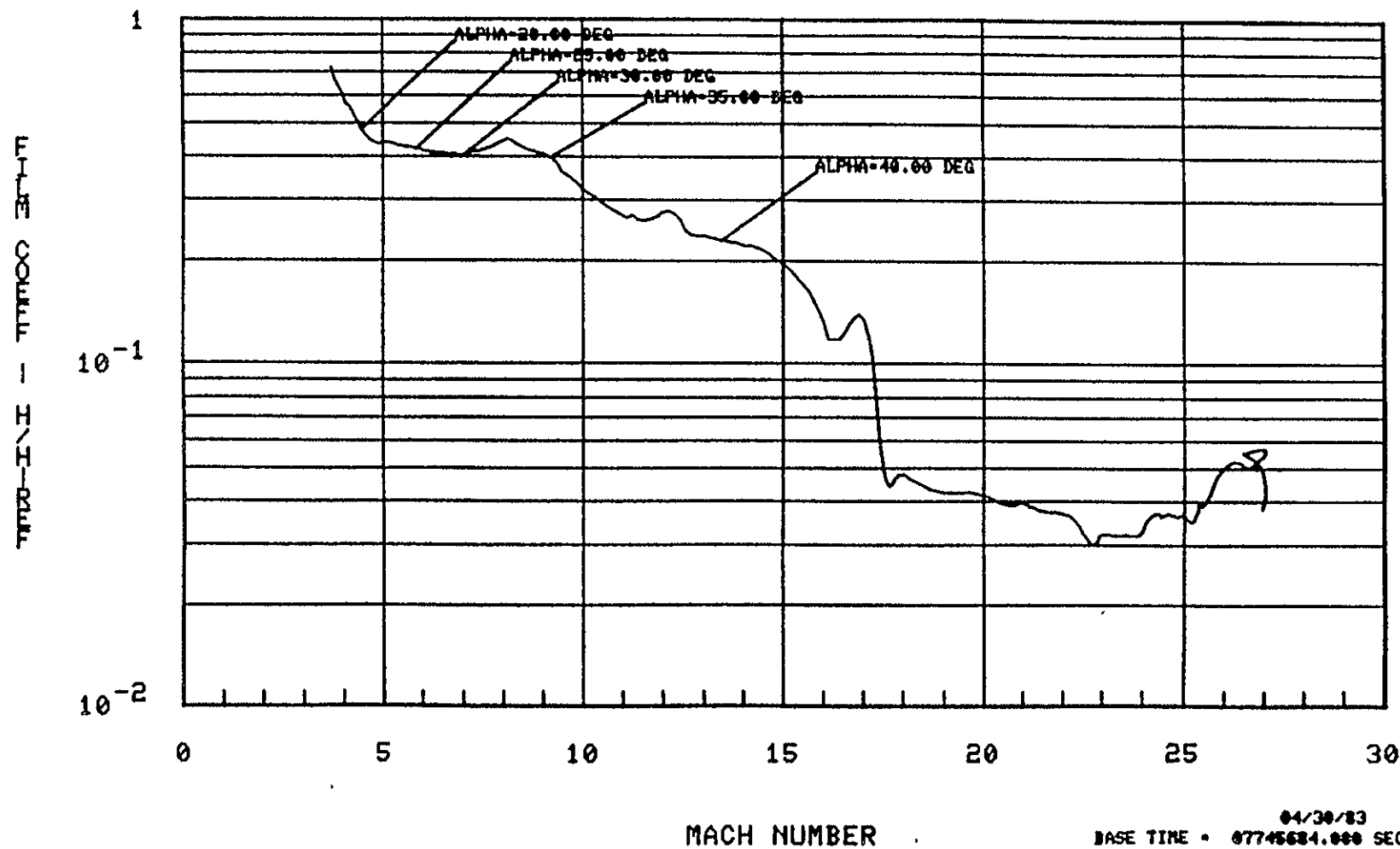


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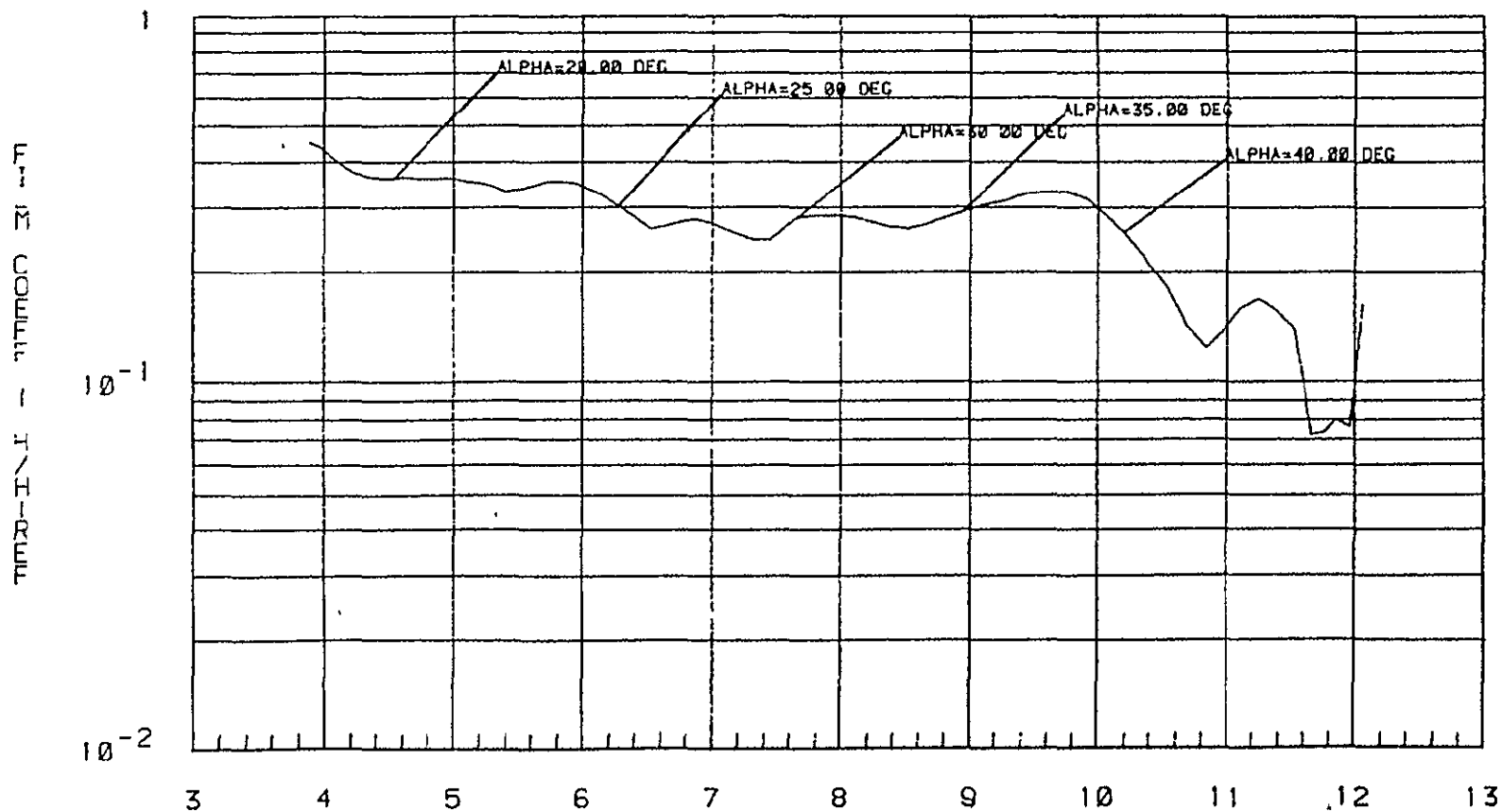
B-408

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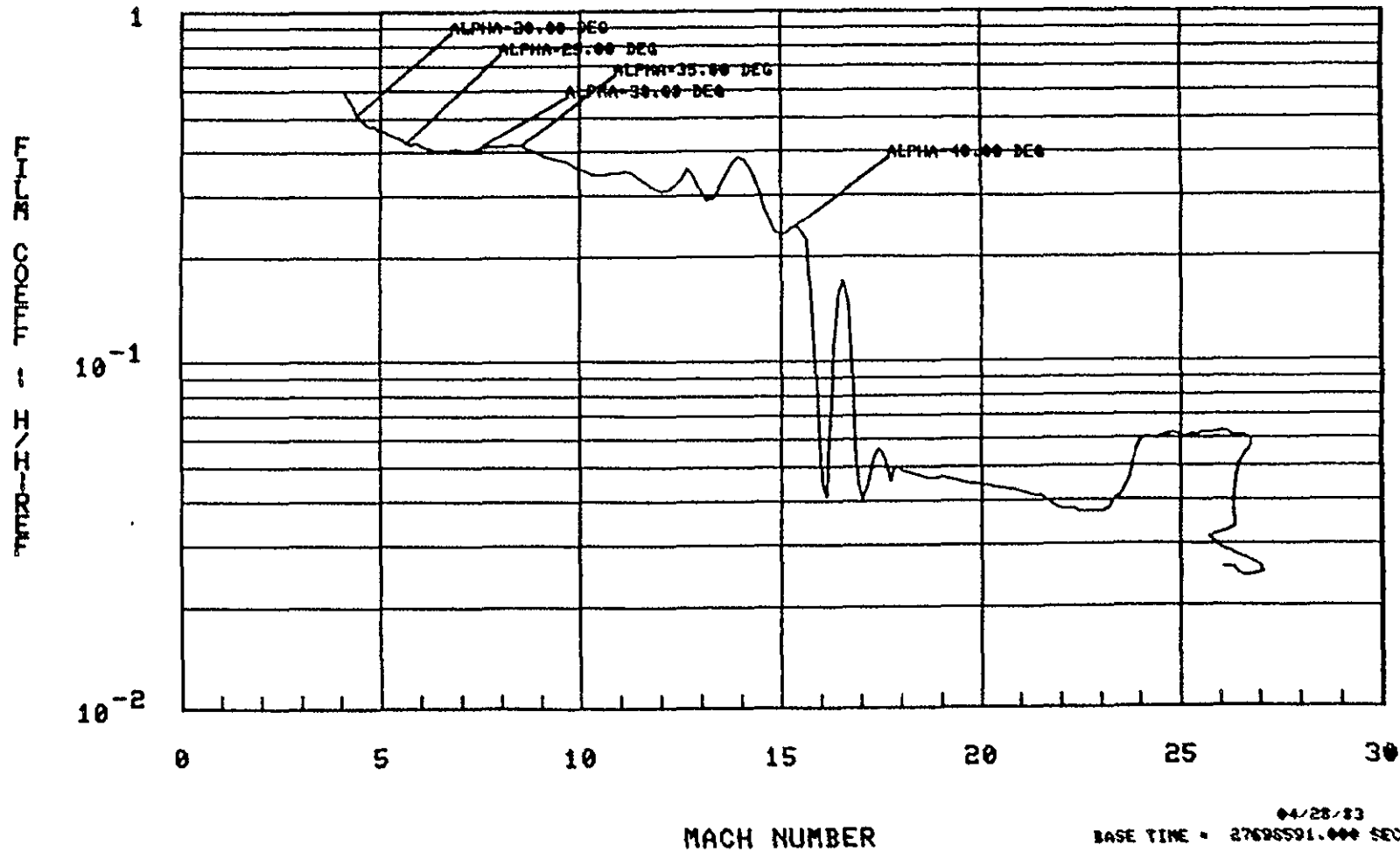
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05/02/83  
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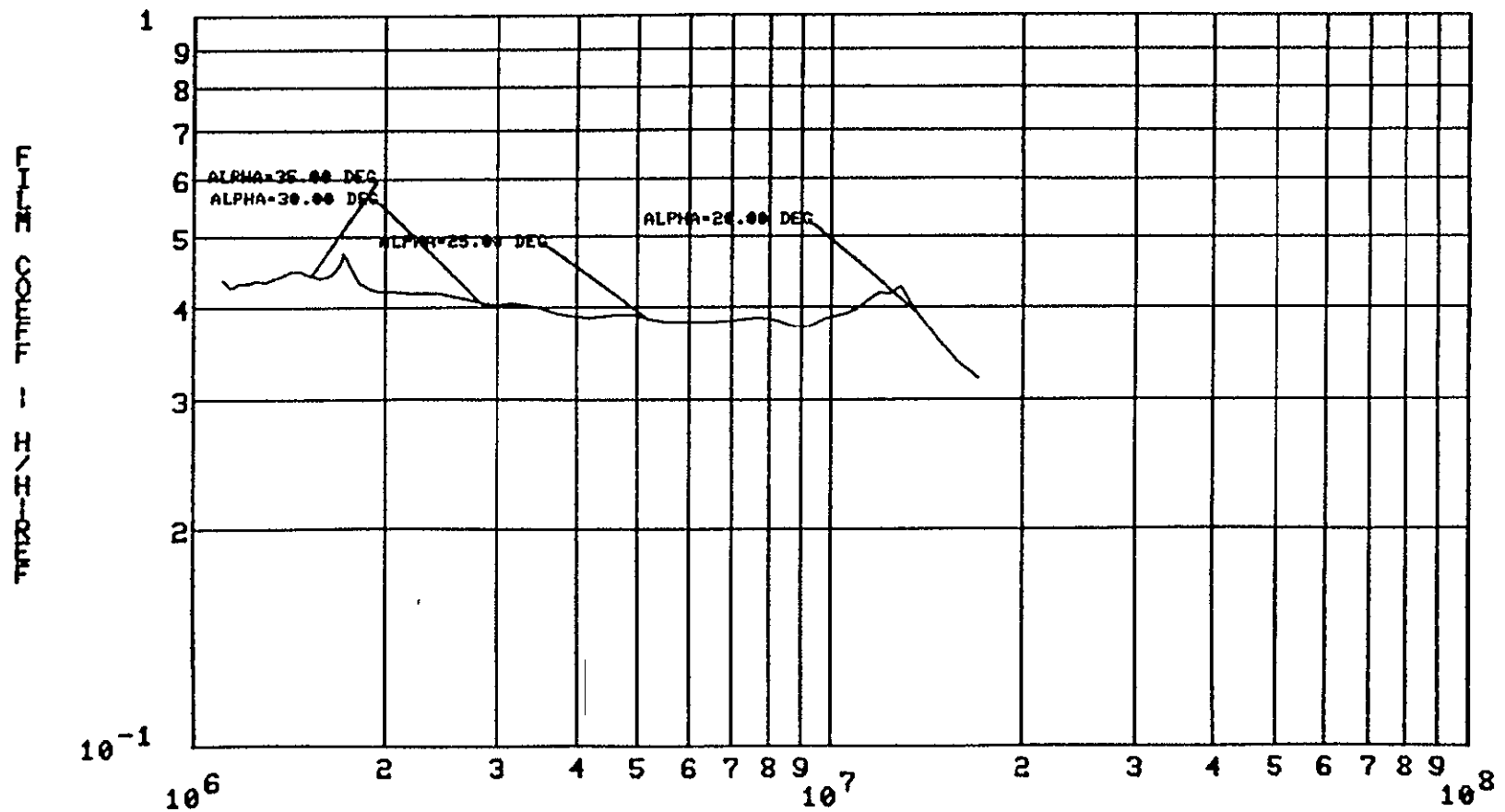


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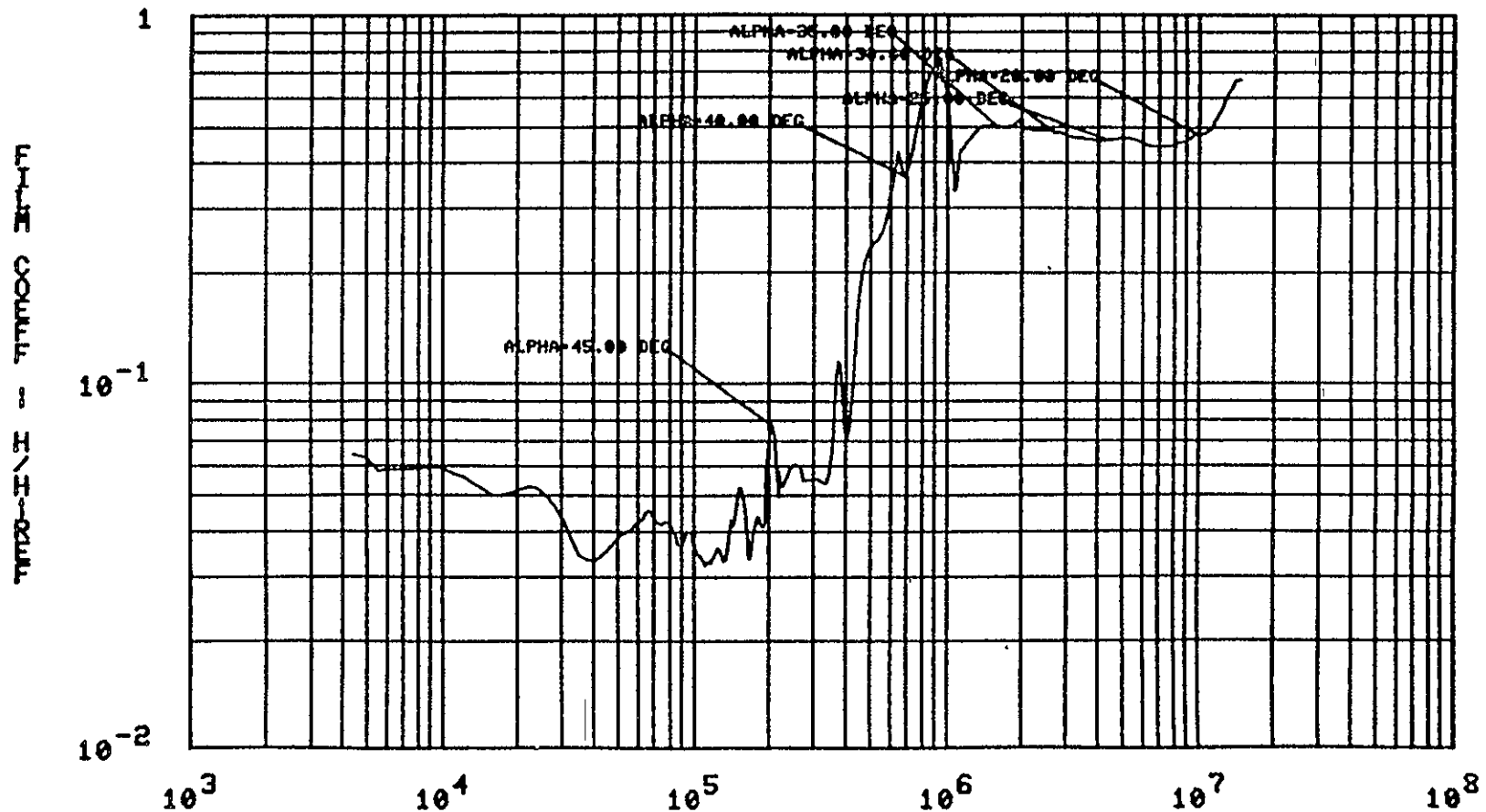
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REYNOLDS NUMBER (NS)

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U07T9500A/H-REF 200-1480 SEC



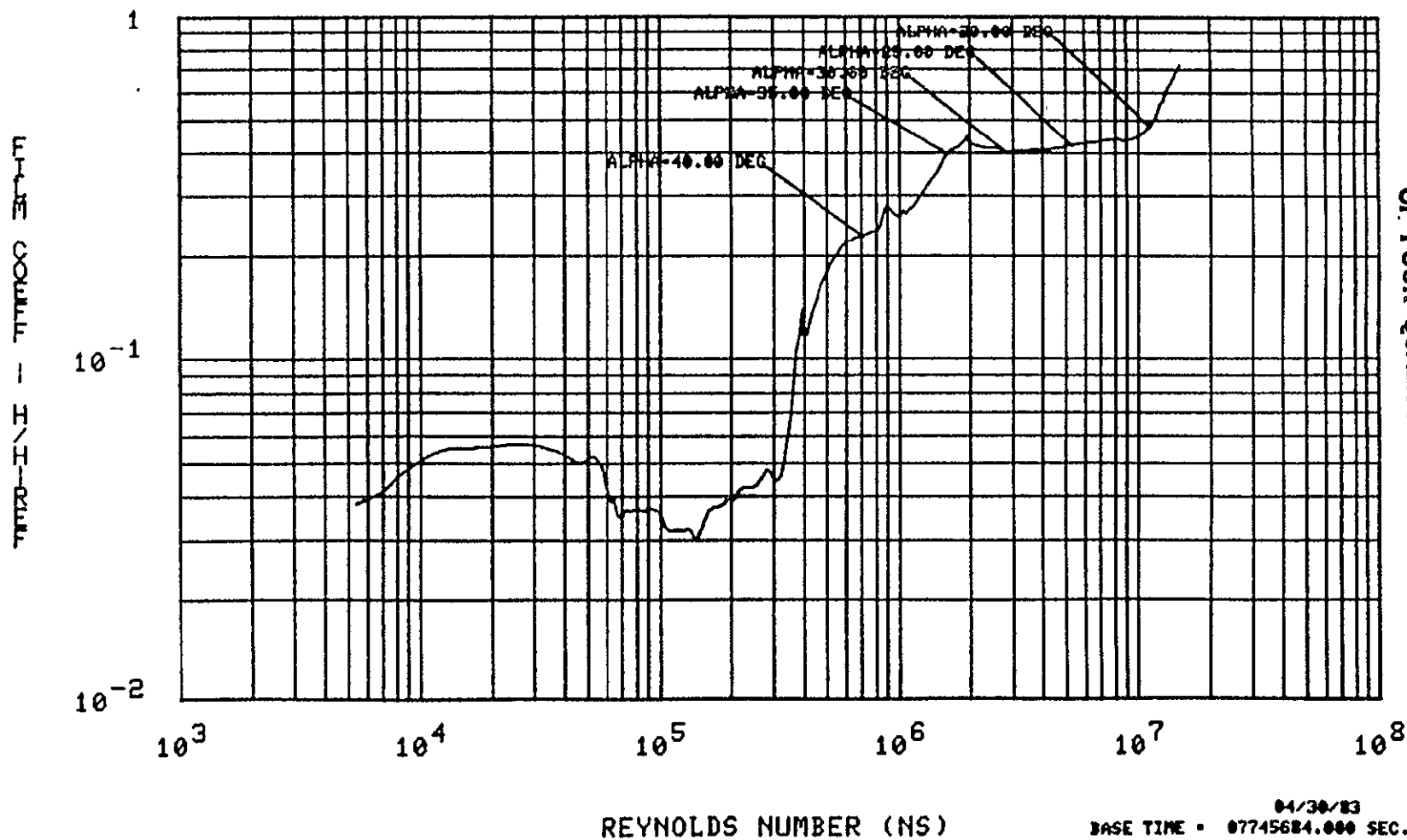
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U07T9500A/H-REF 200-1380 SEC



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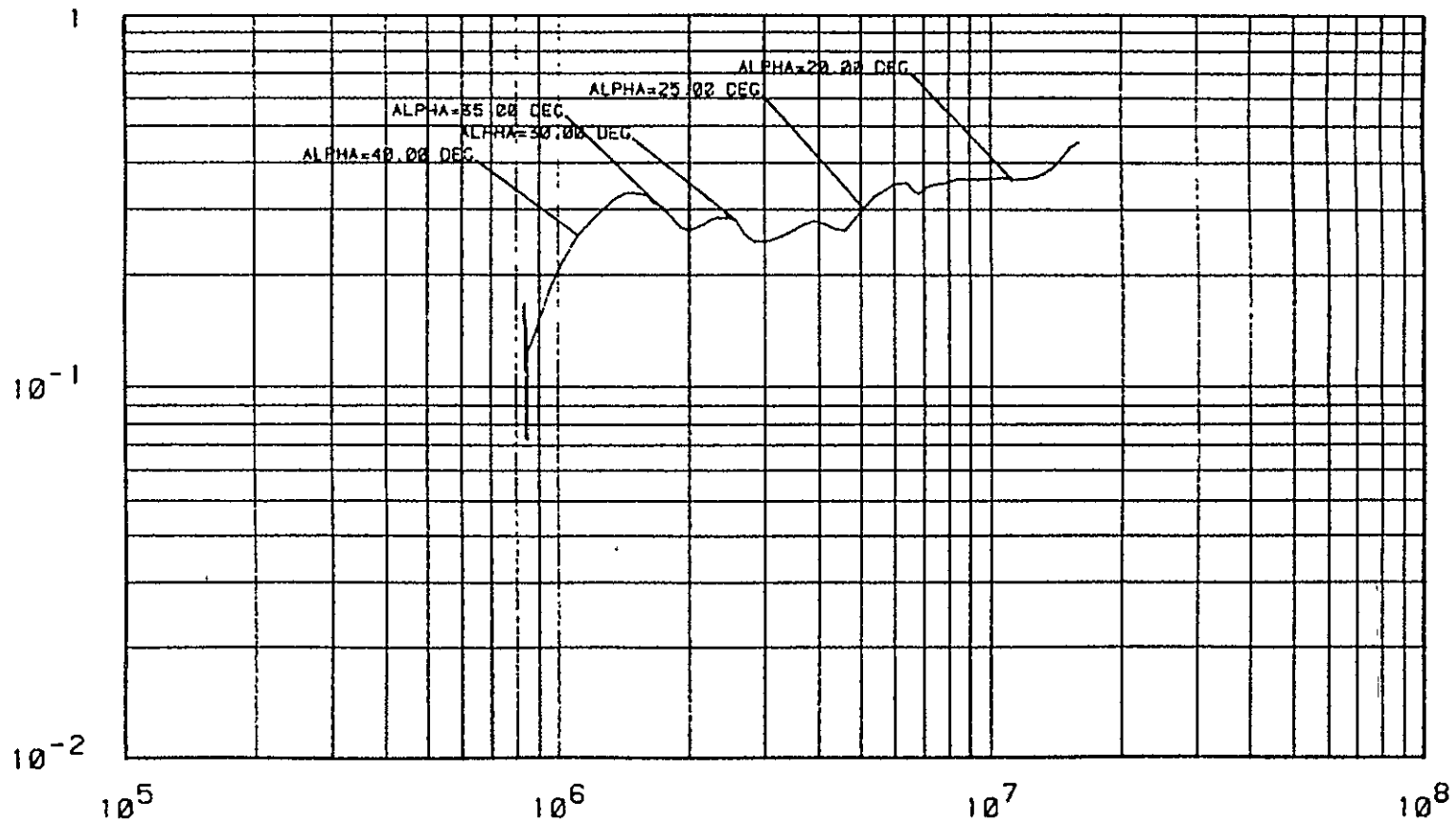
B-473

04/30/83  
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TIME COEFF - I/I-CL



REYNOLDS NUMBER (NS)

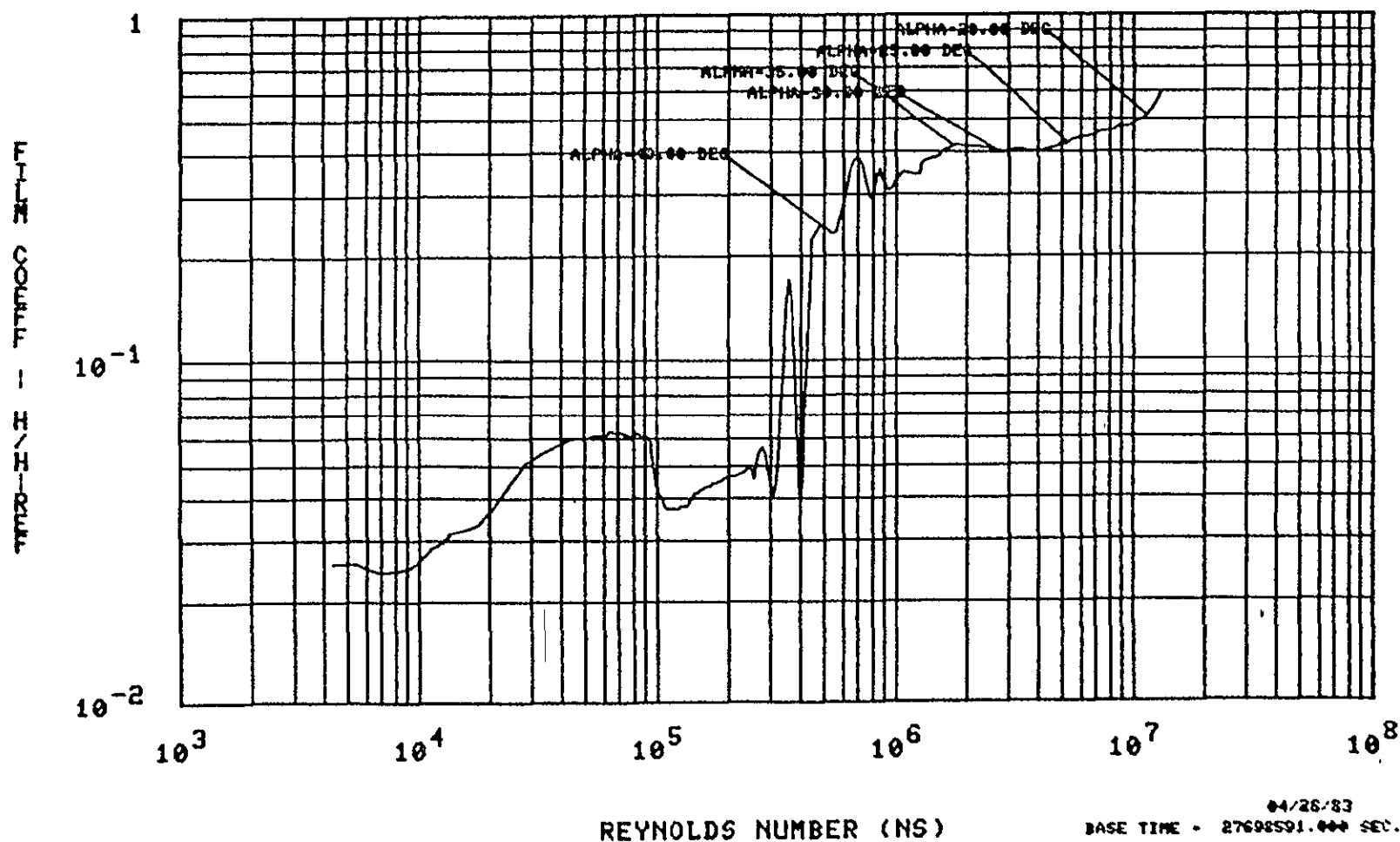
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B-474

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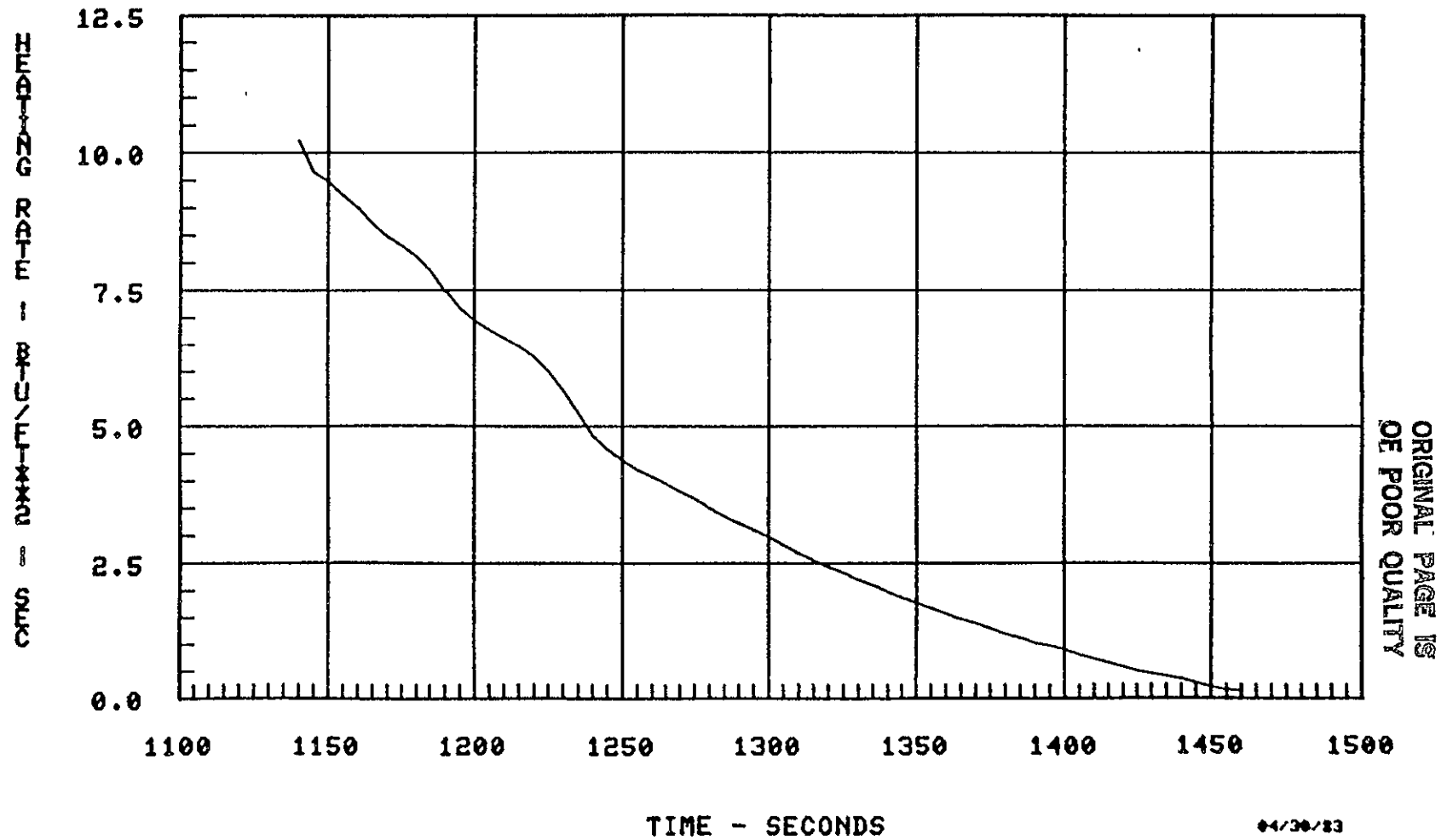
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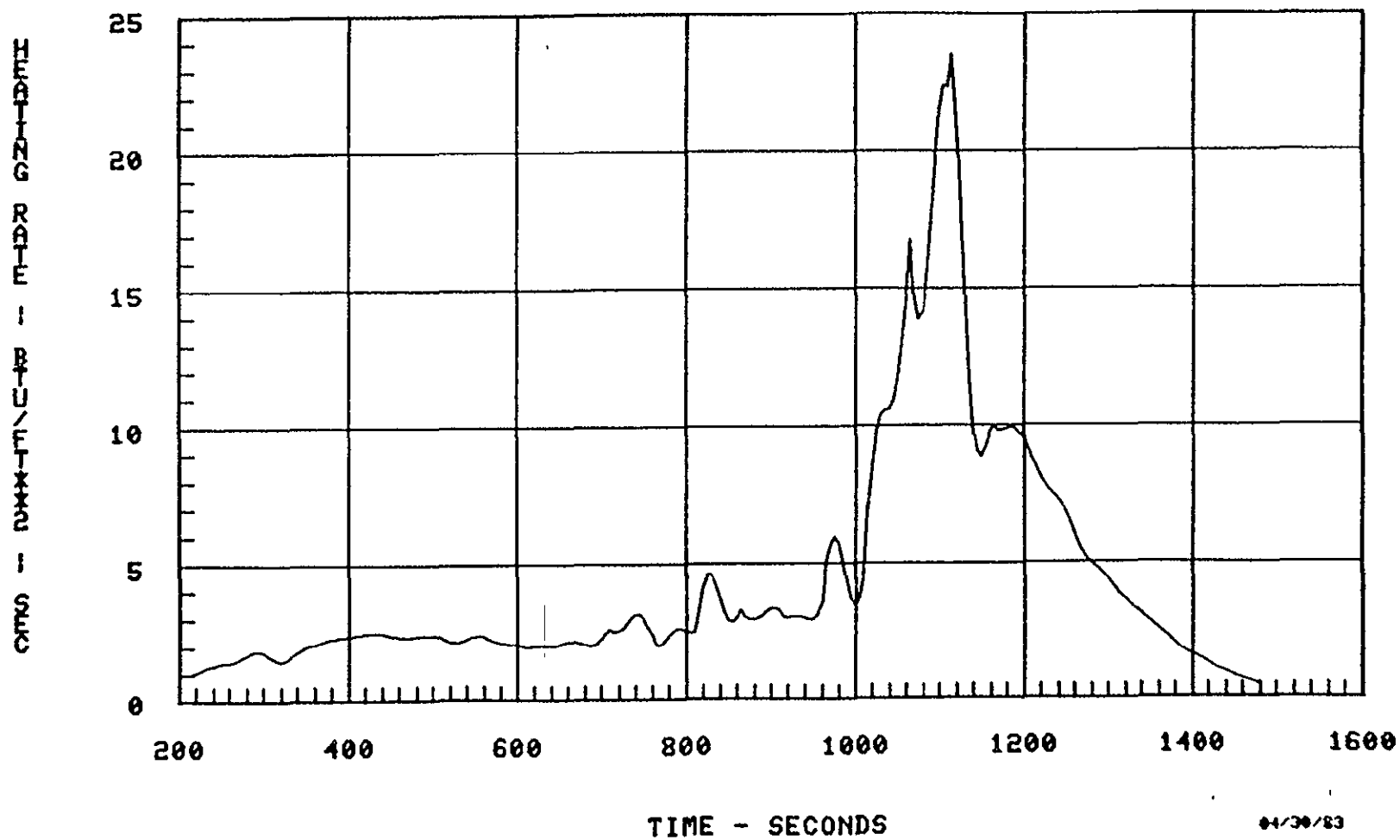
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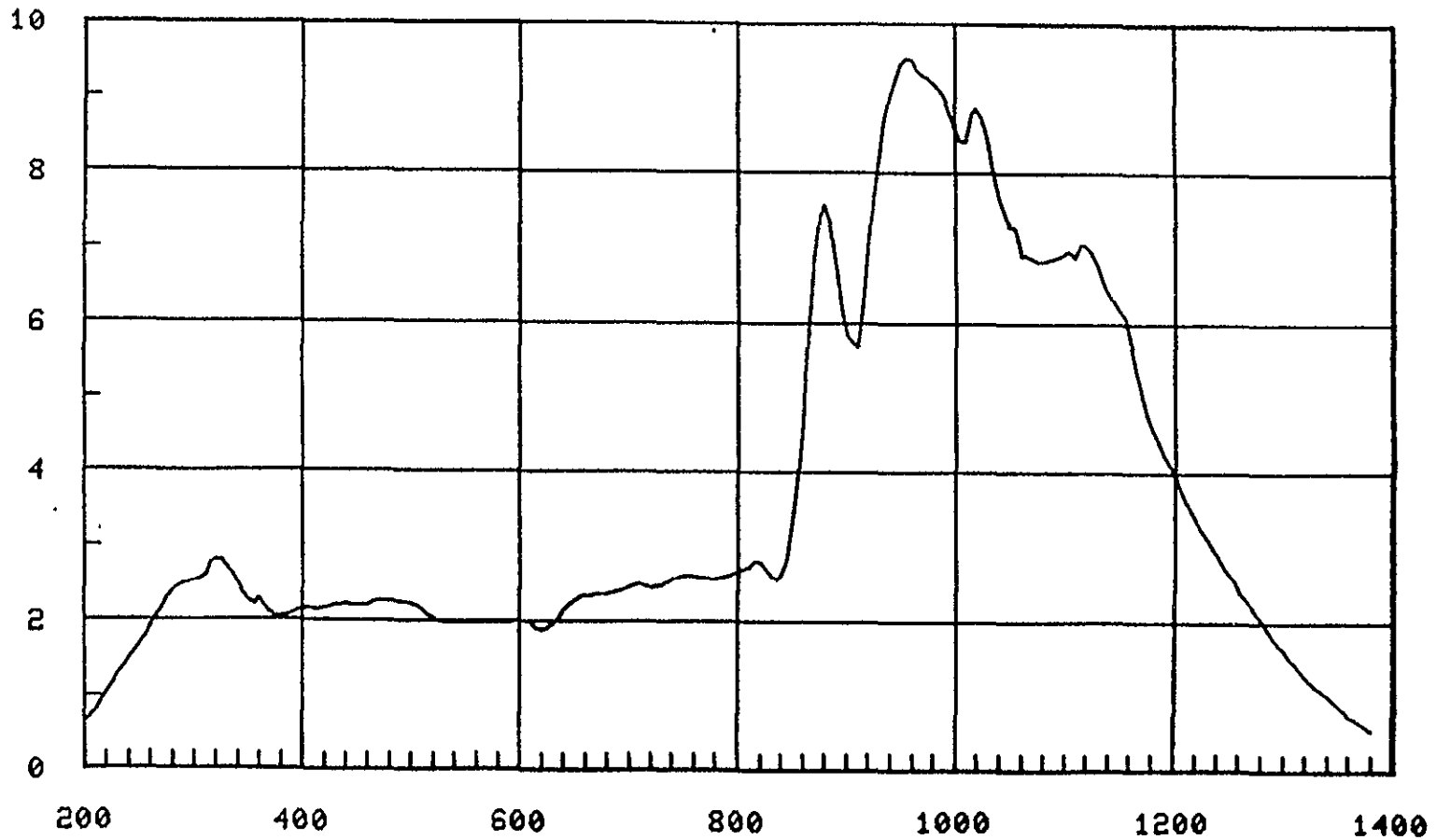
B-417

04/30/83

# STS-3 (107 FT LENGTH CL X/L=1.02) FLIGHT PARAMETER COMPARISO

U07T9500A

INTEGRATED ACCEL - ACCELERATION - GALS



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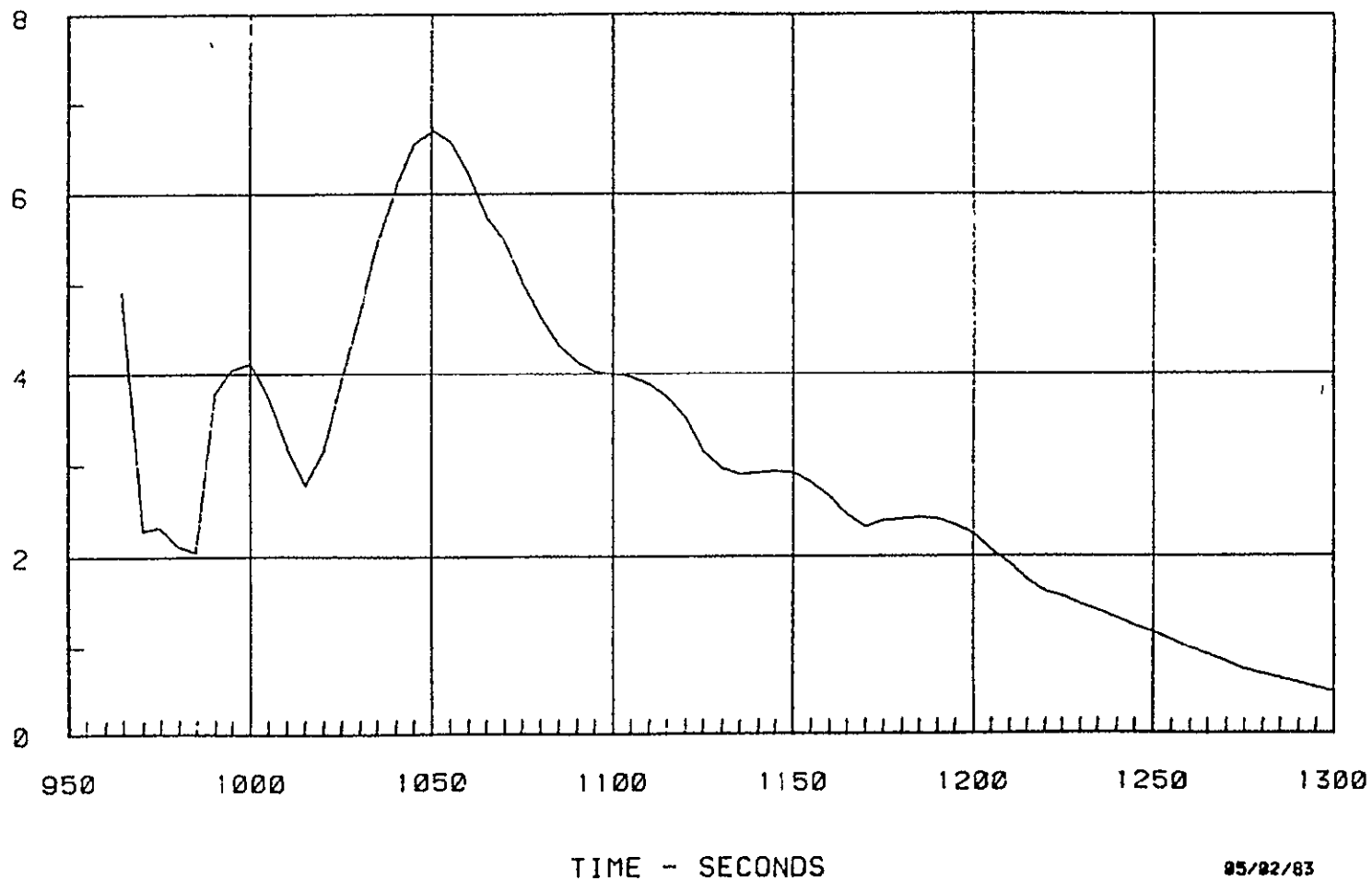
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04/30/83

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V87T9500A

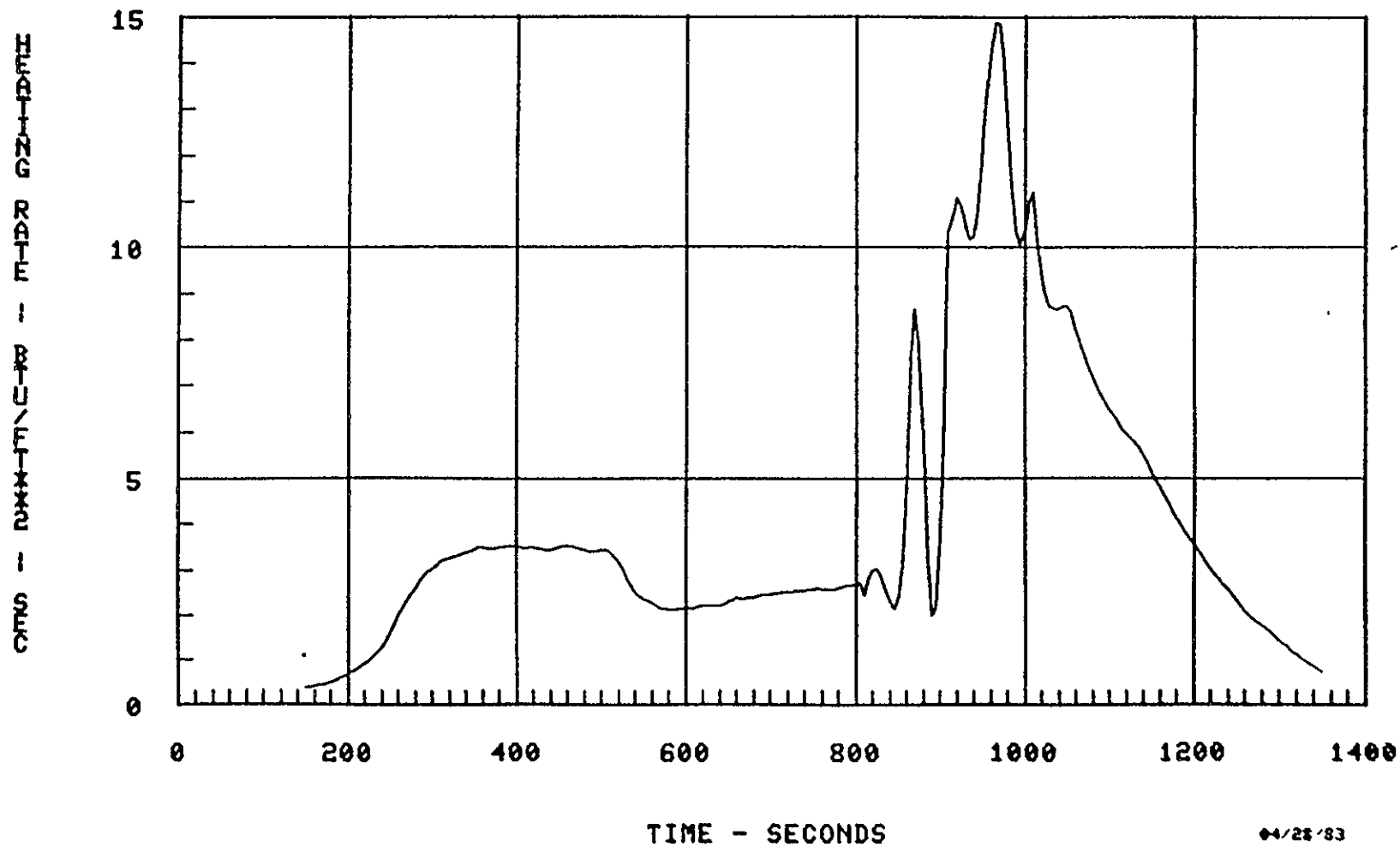
HEATING RATE - BTU/FT\*\*2 - SEC



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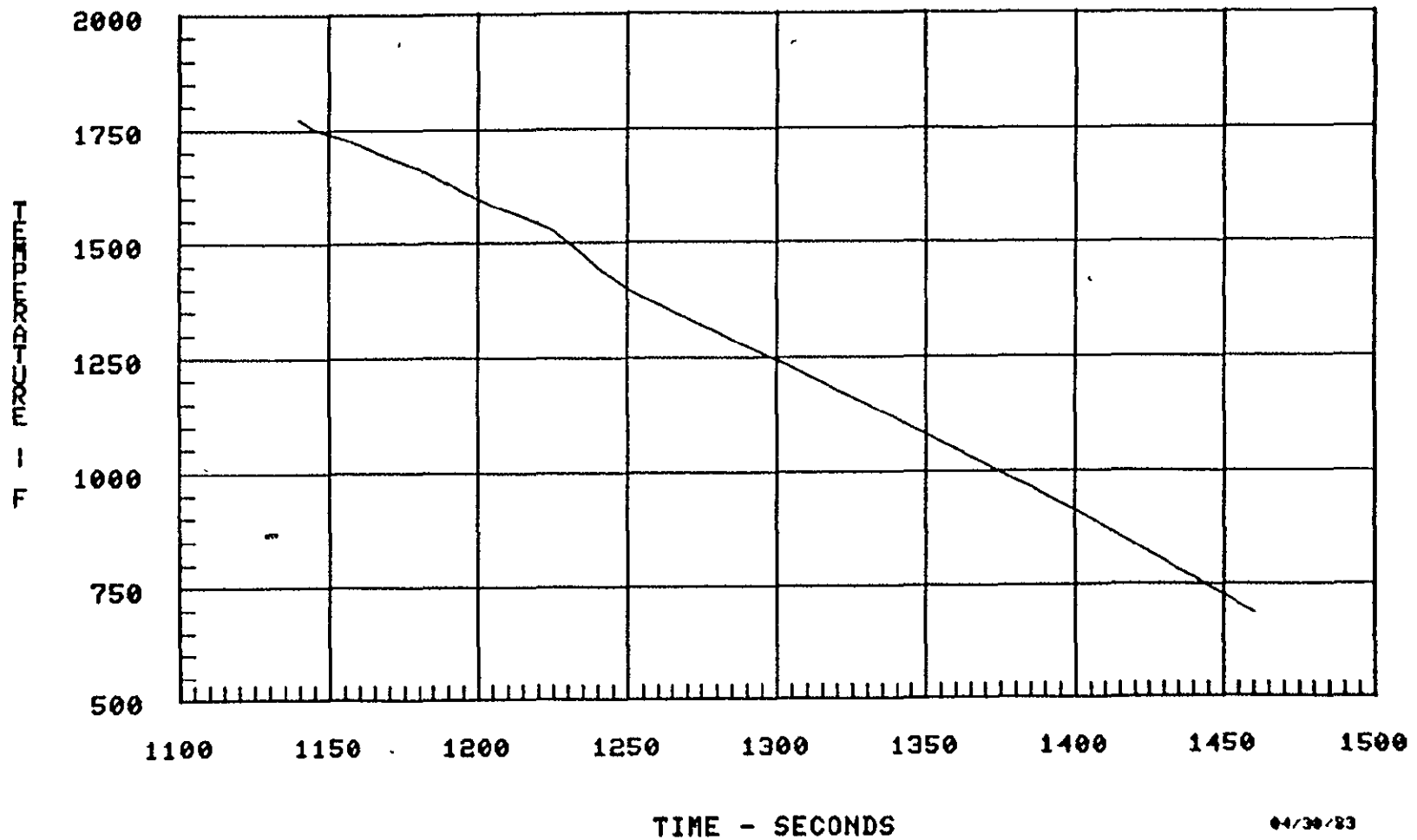
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B-420

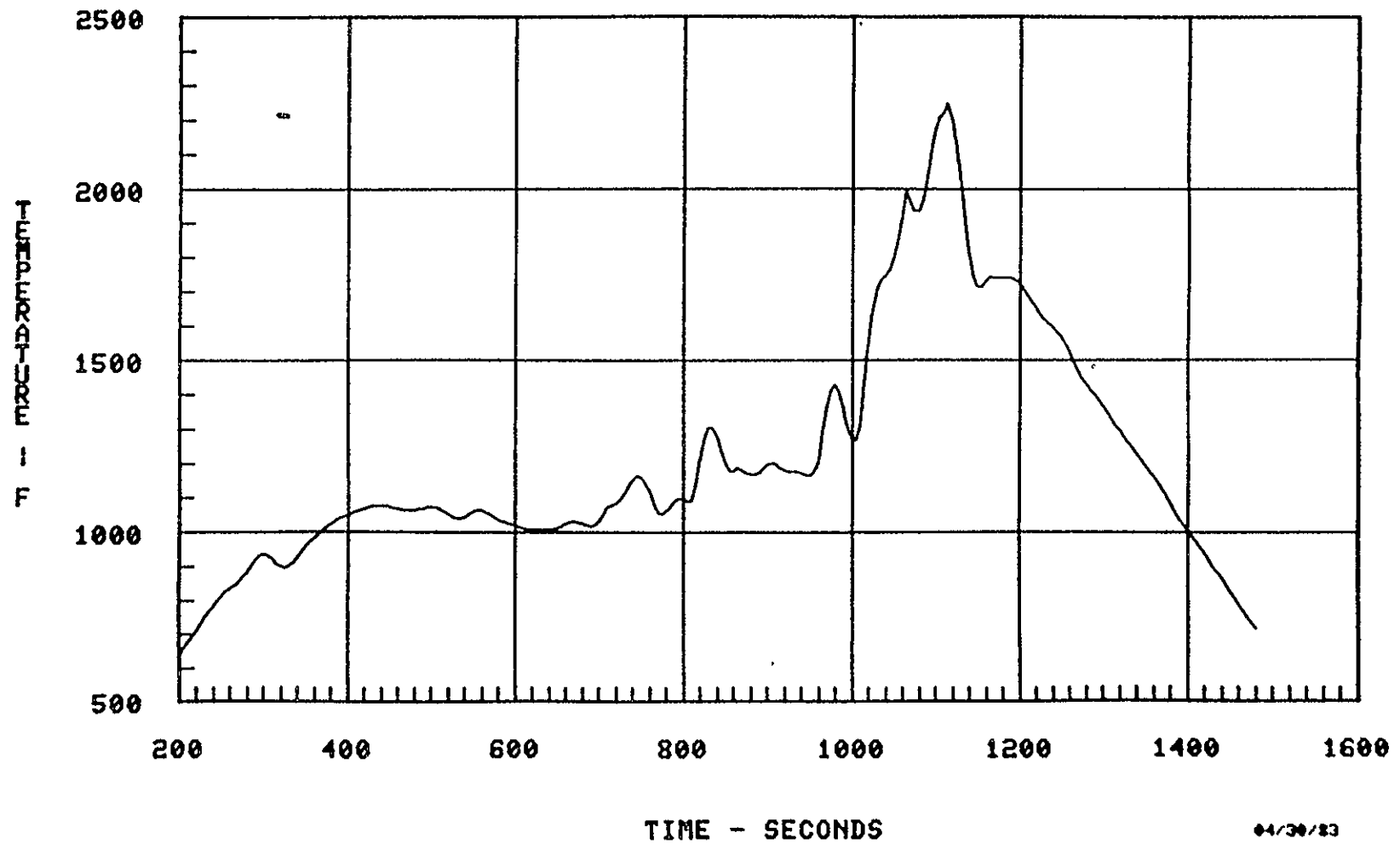
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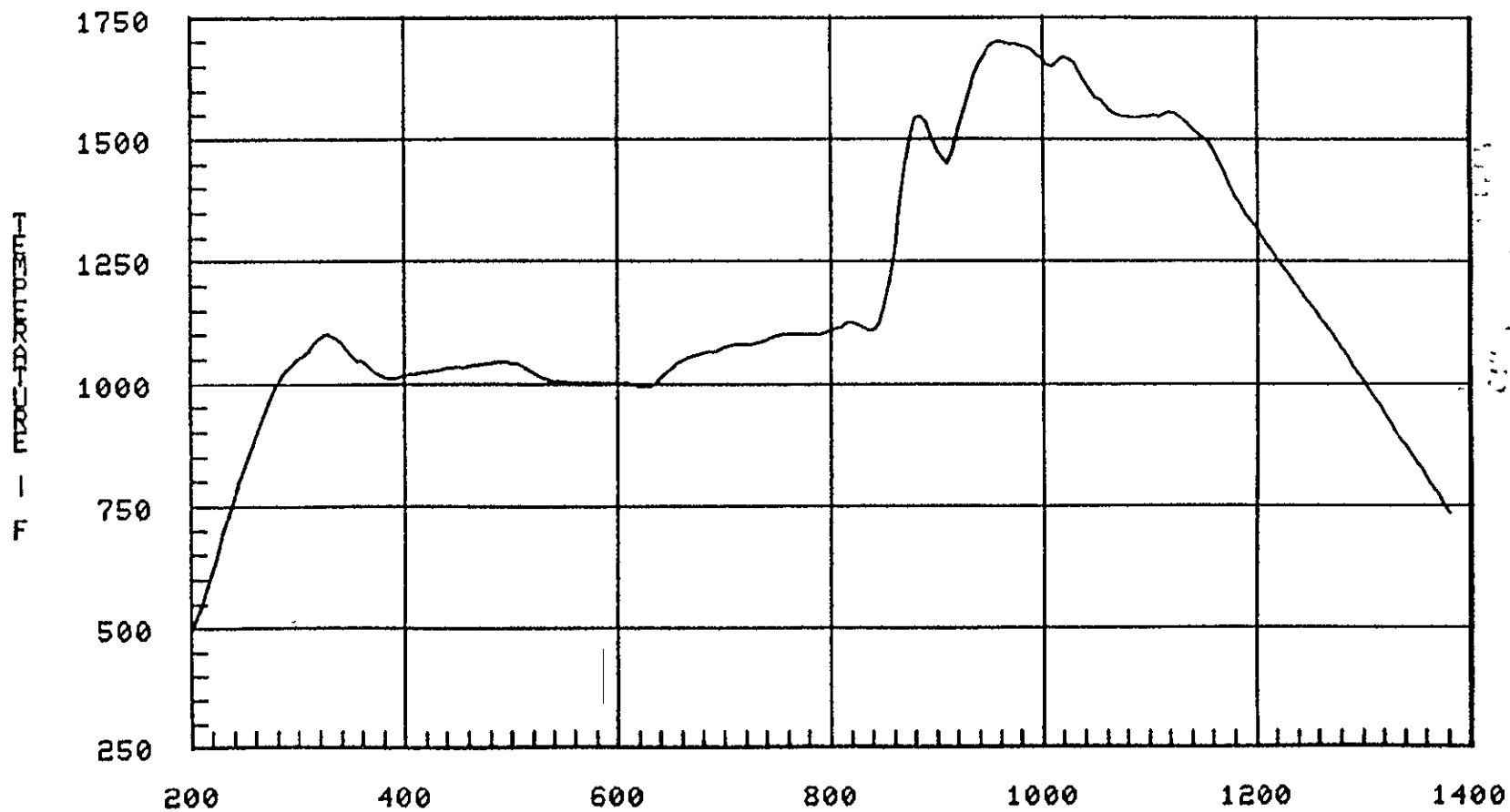
# STS-2 (107 FT LENGTH CL X/L=1.02) FLIGHT PARAMETER COMPARISON

————— V07T9500A



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U07T9500A

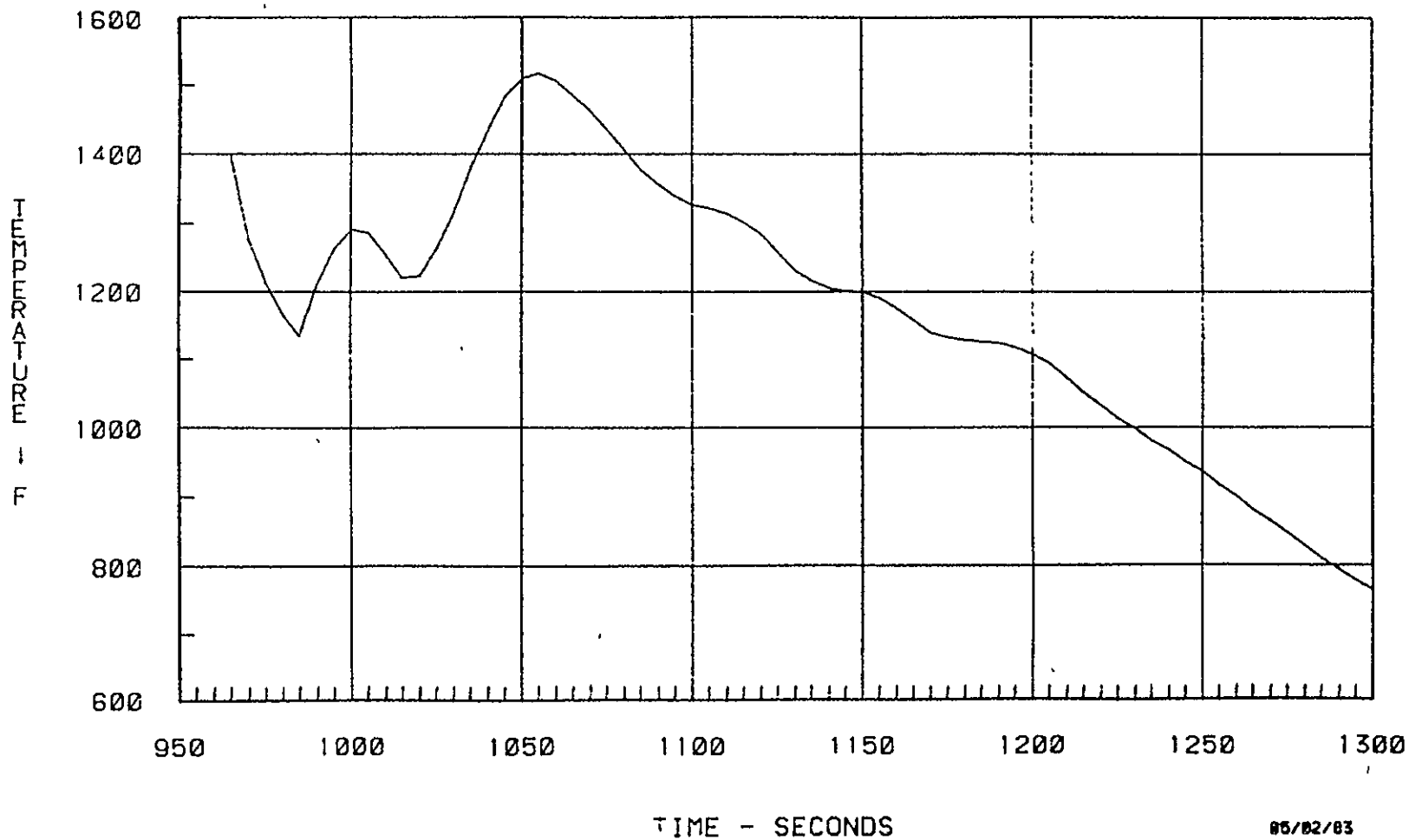


TIME - SECONDS

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VB7T0500A



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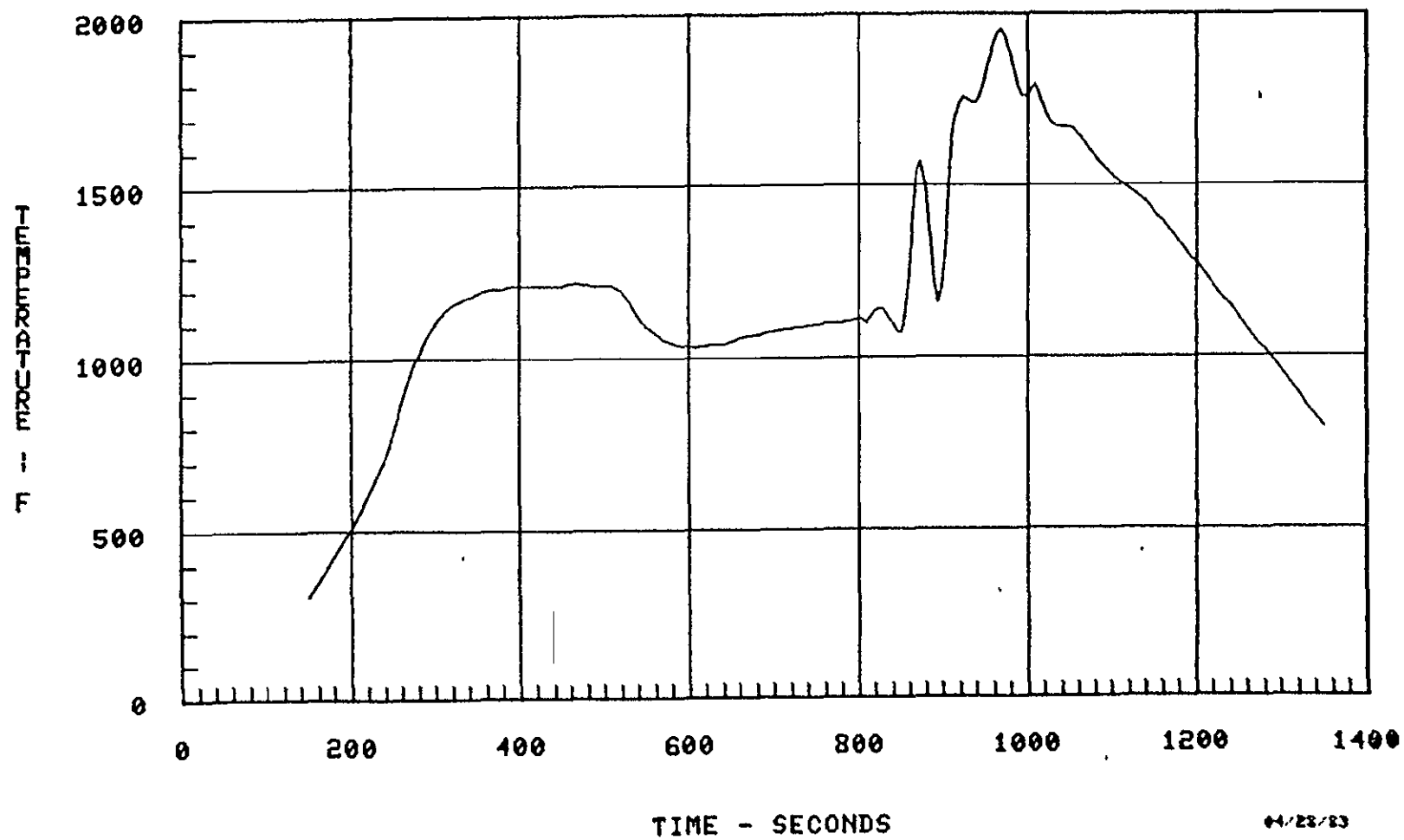
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05/02/83



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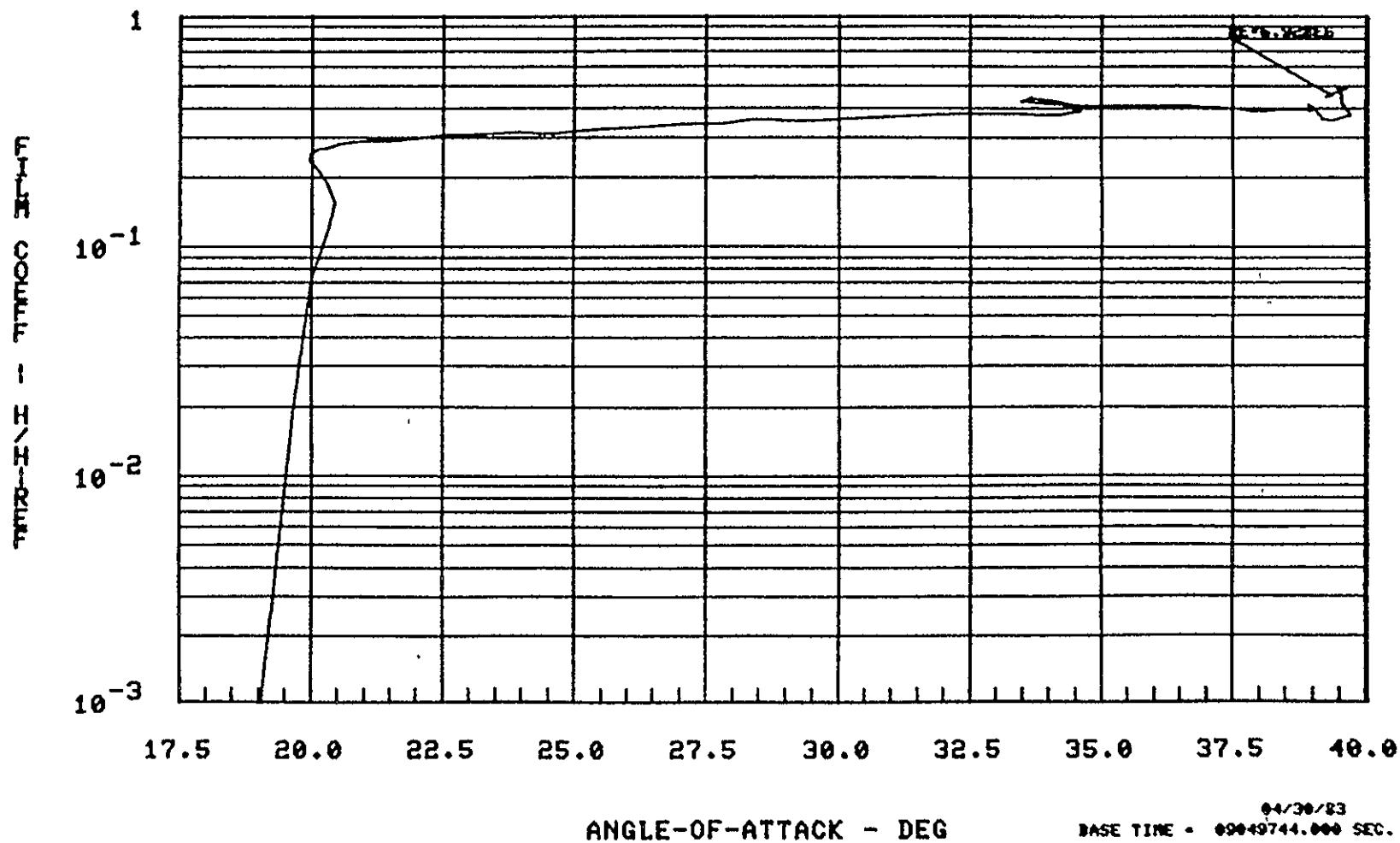


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04/28/83

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U07T9502A/H-REF 1065-1460 SEC

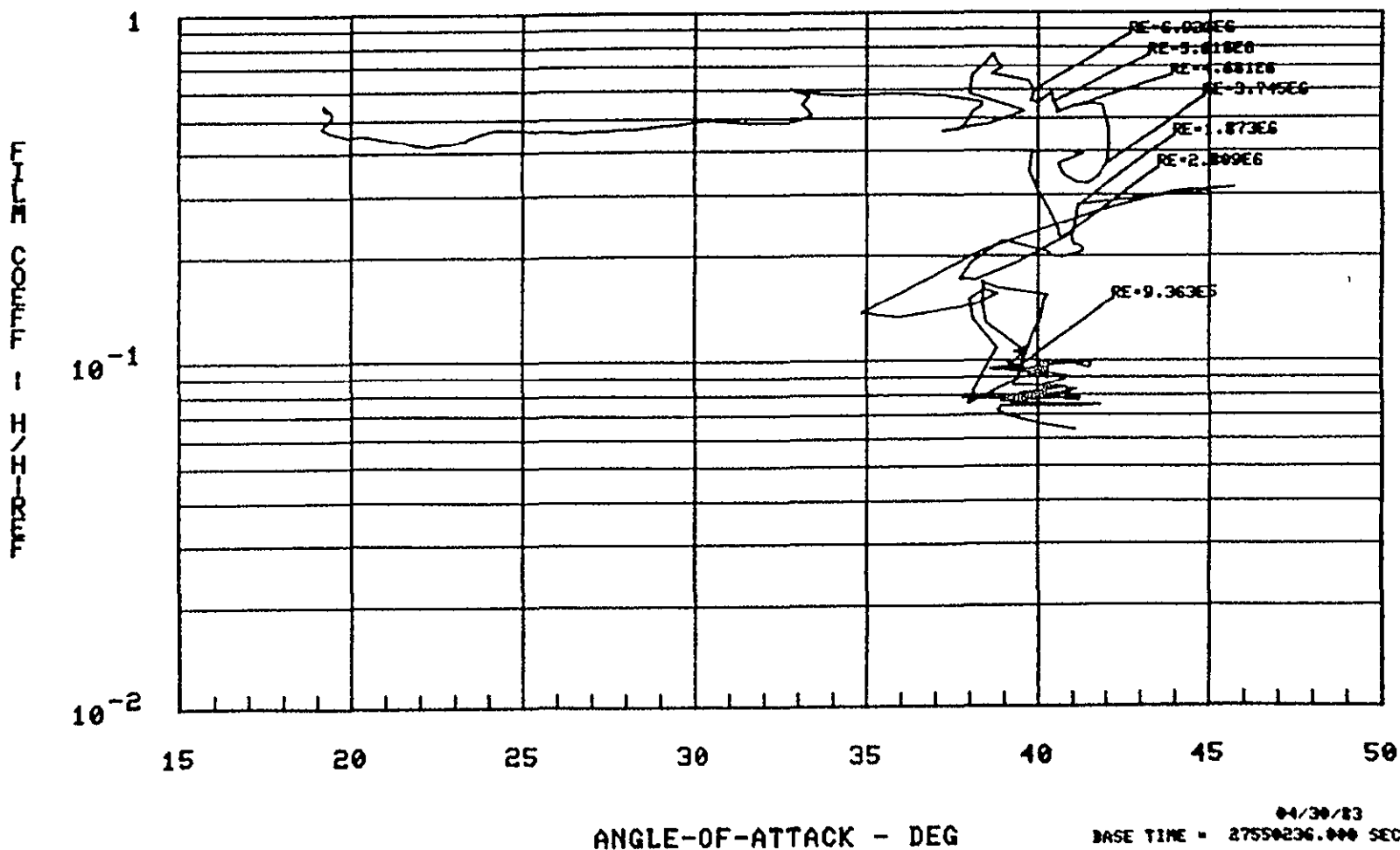


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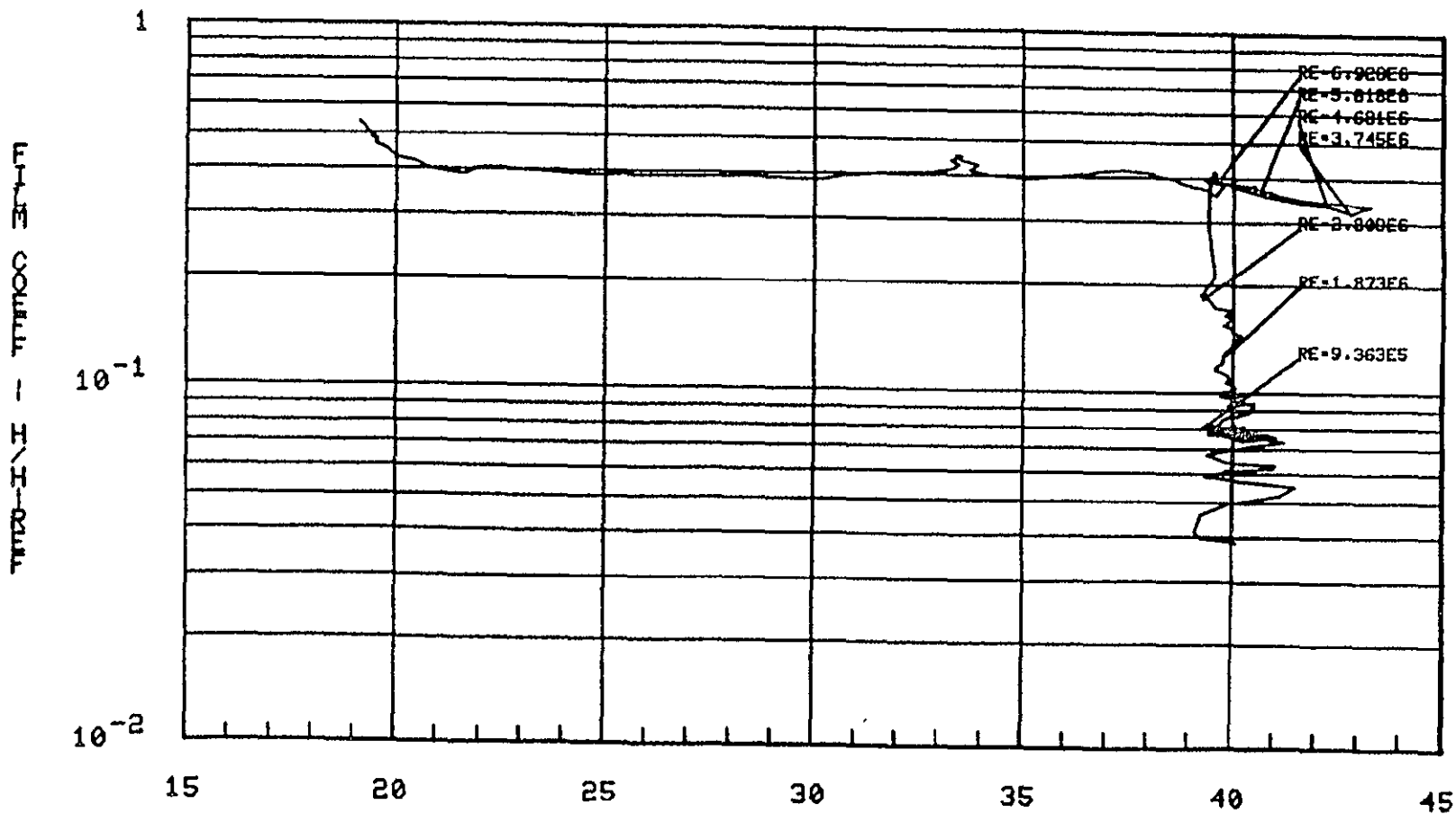
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B-428

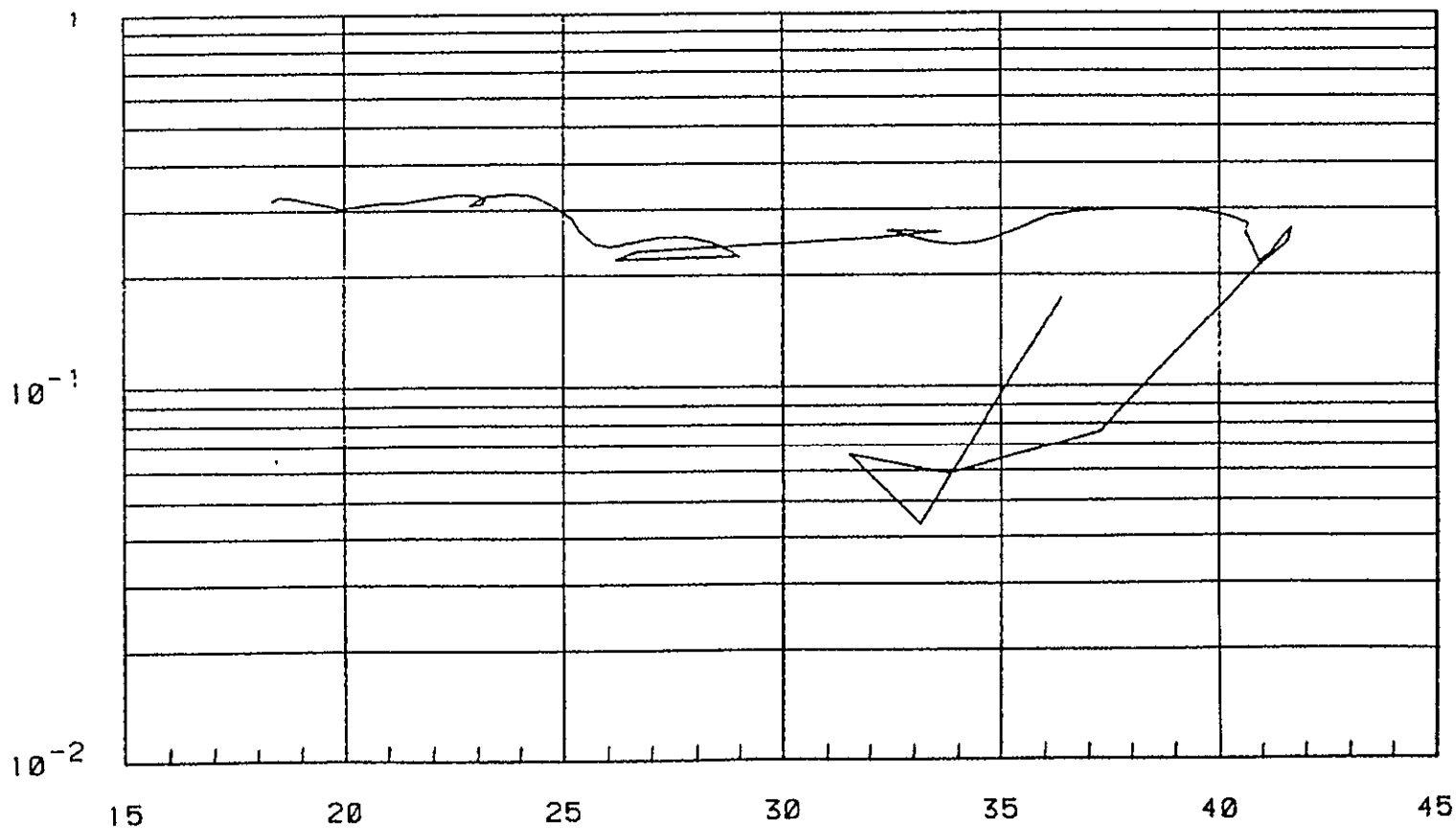
ANGLE-OF-ATTACK - DEG

04/30/83  
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V07T0502A/H-REF 065-1300 SEC

WING COEFF - I/I-CL



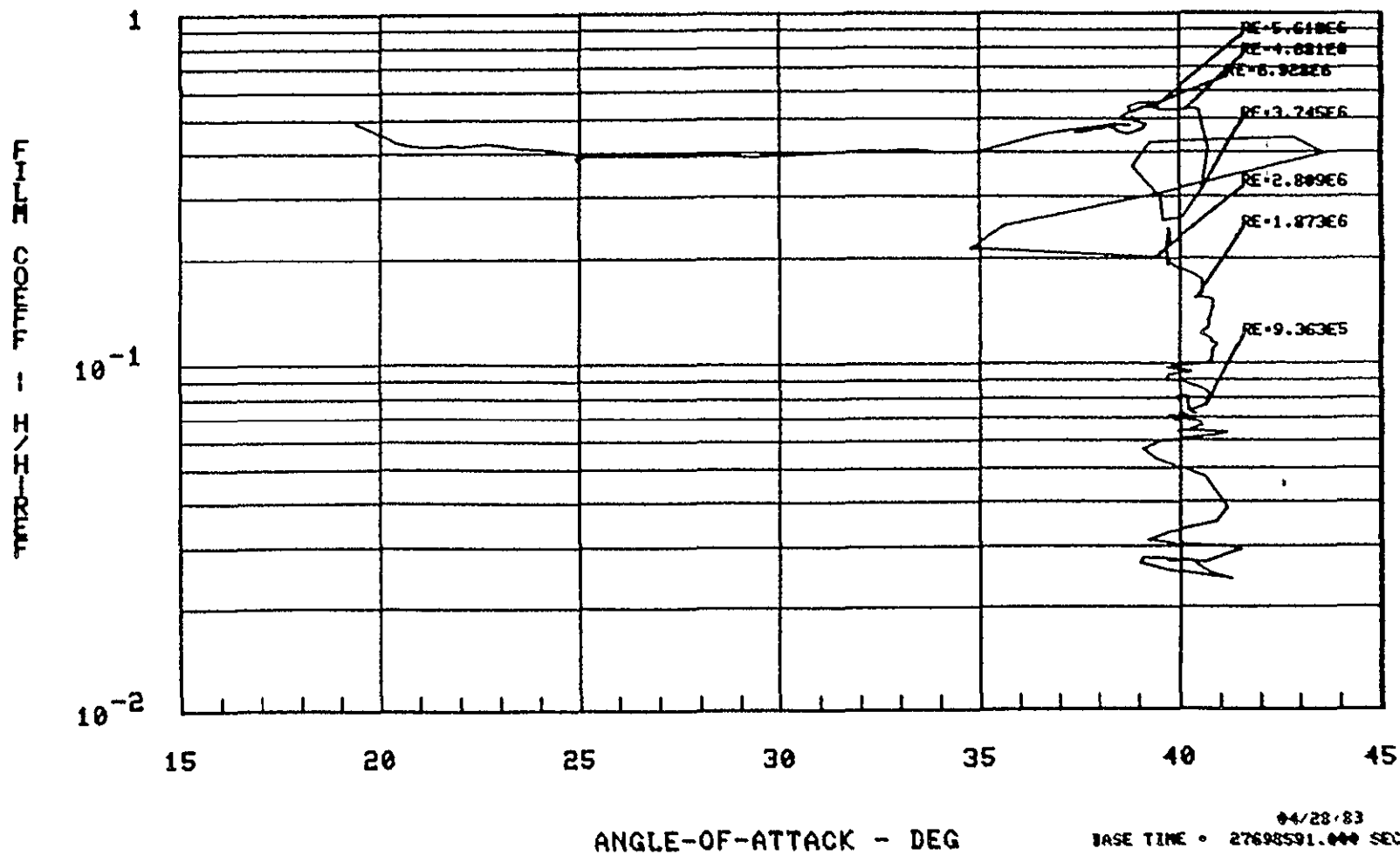
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ANGLE-OF-ATTACK - DEG

05/02/83  
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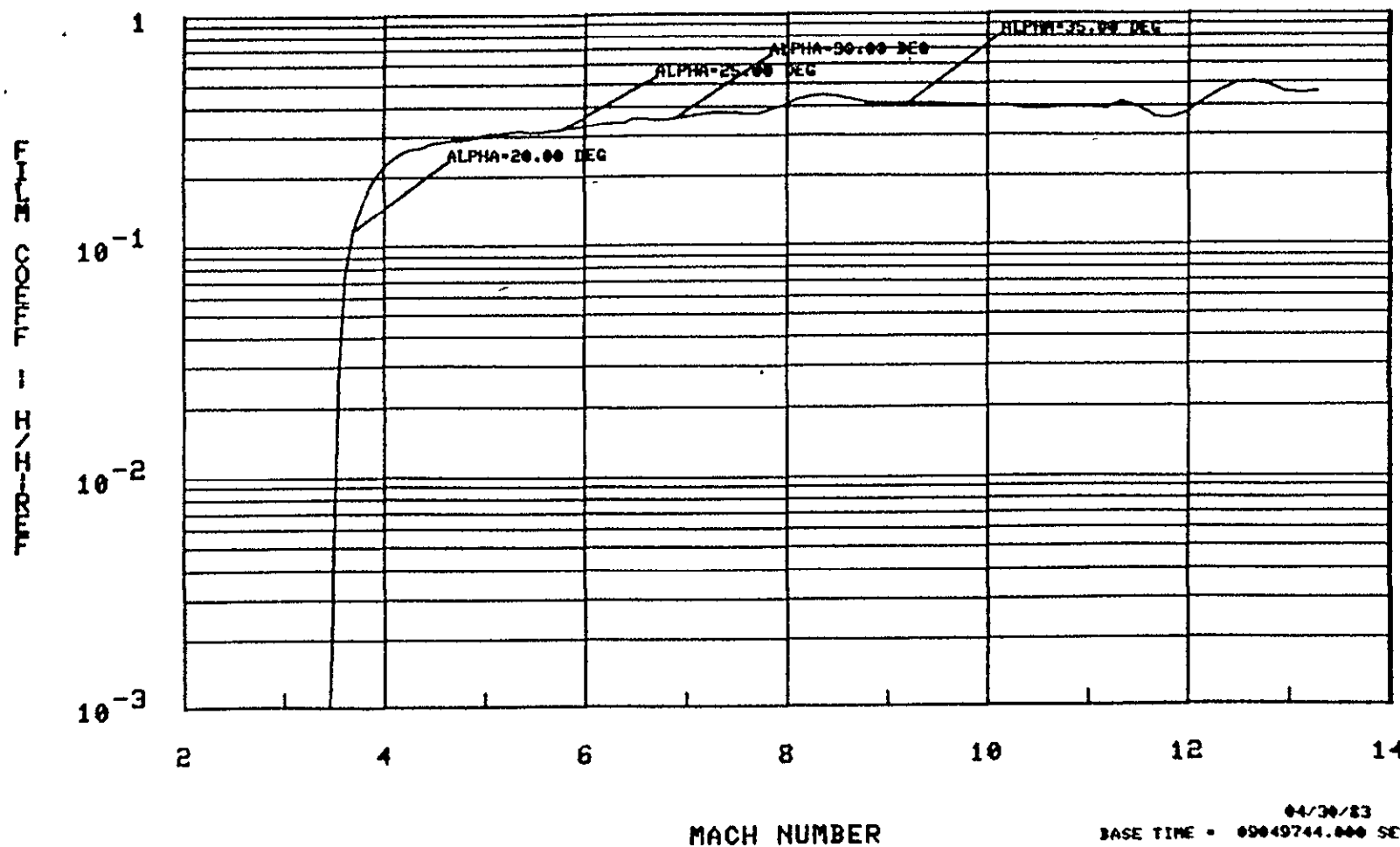


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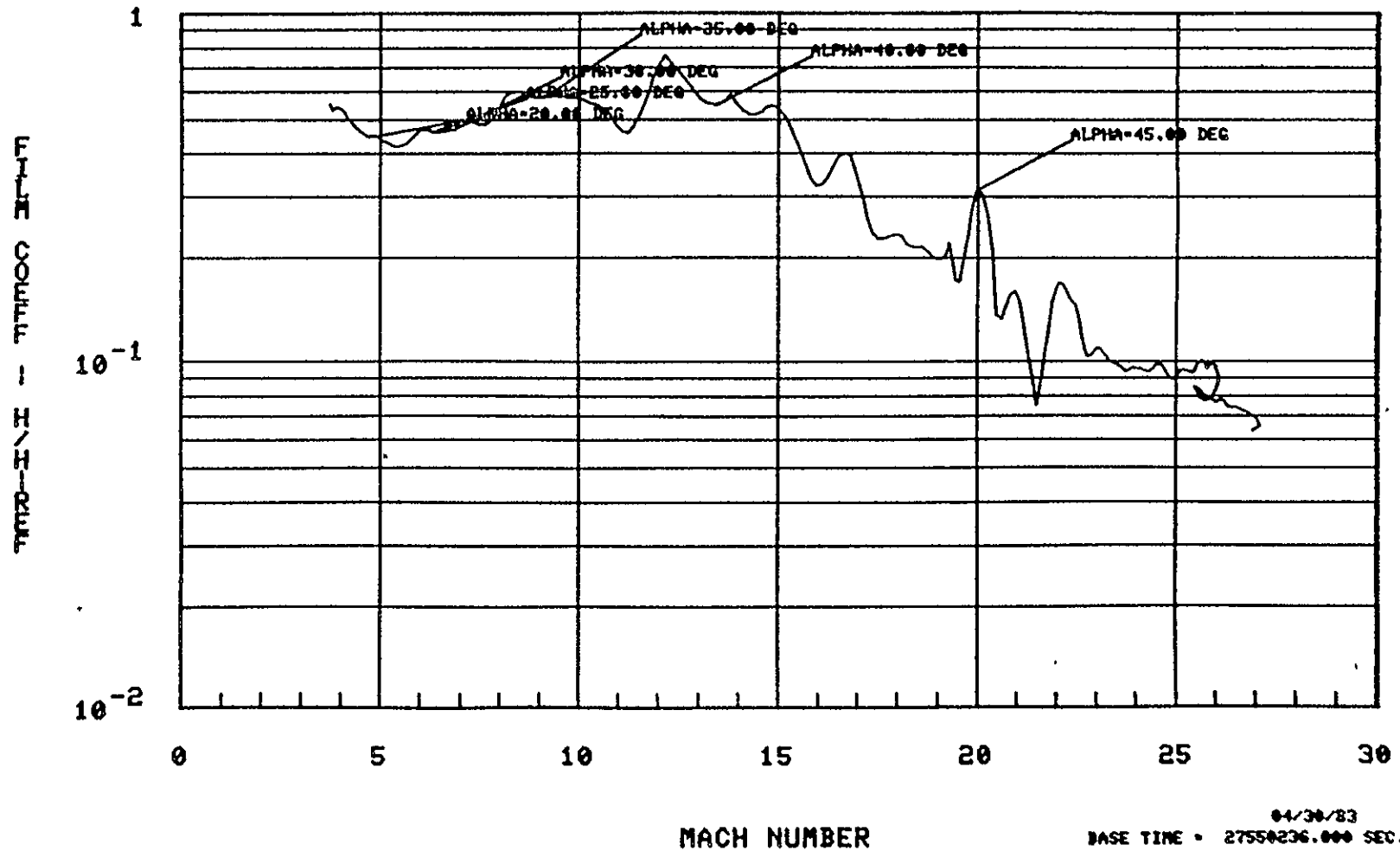
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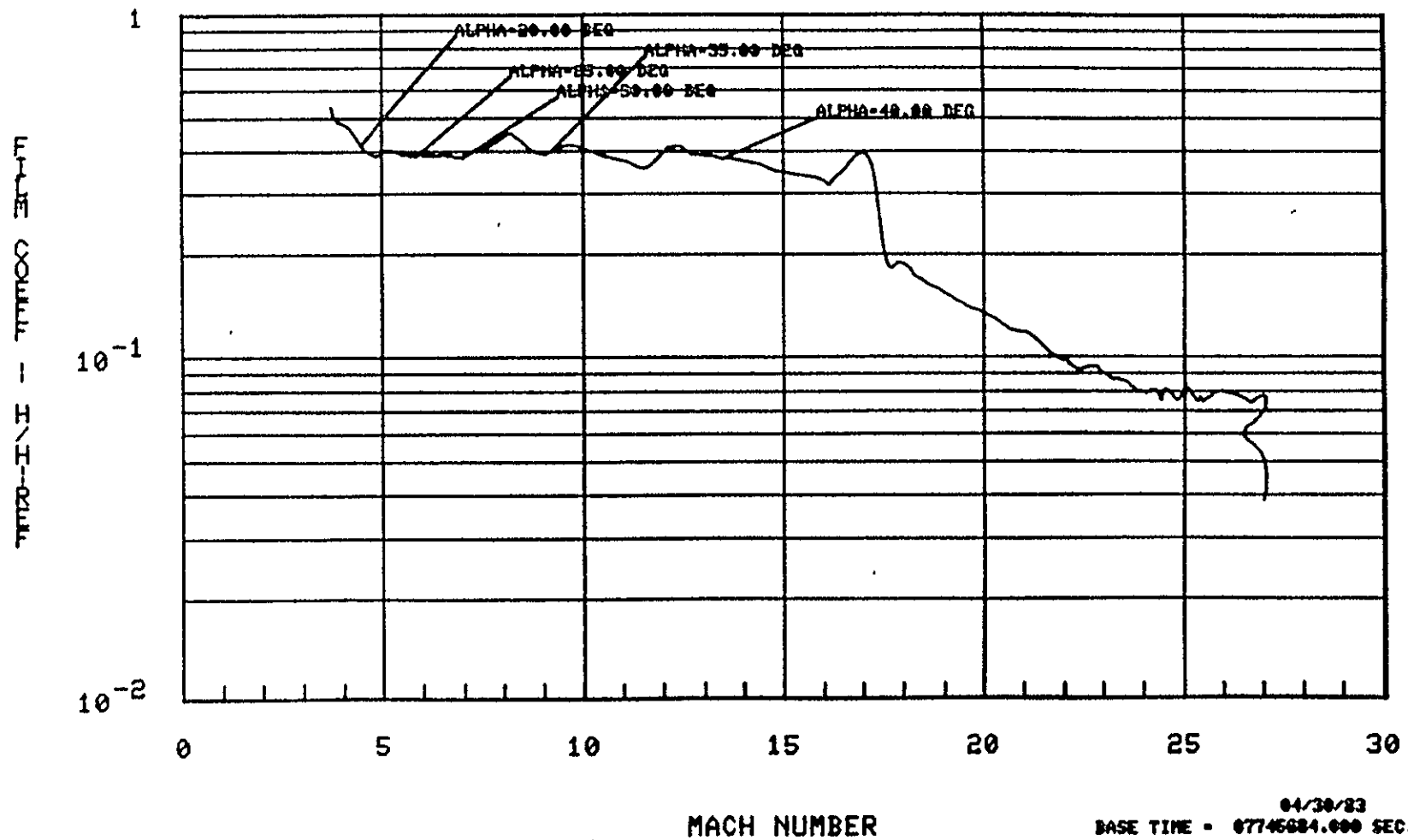


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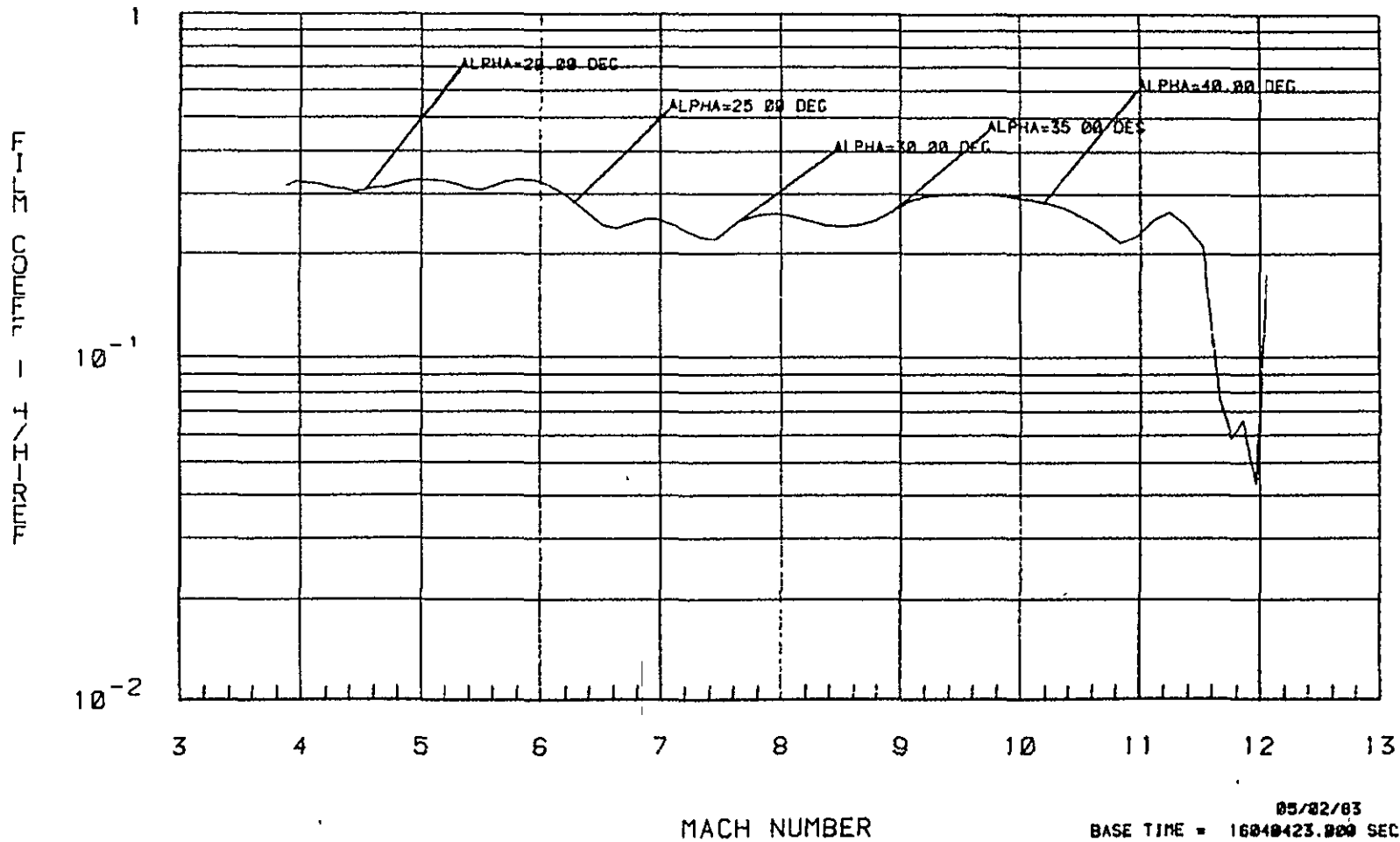


B-433

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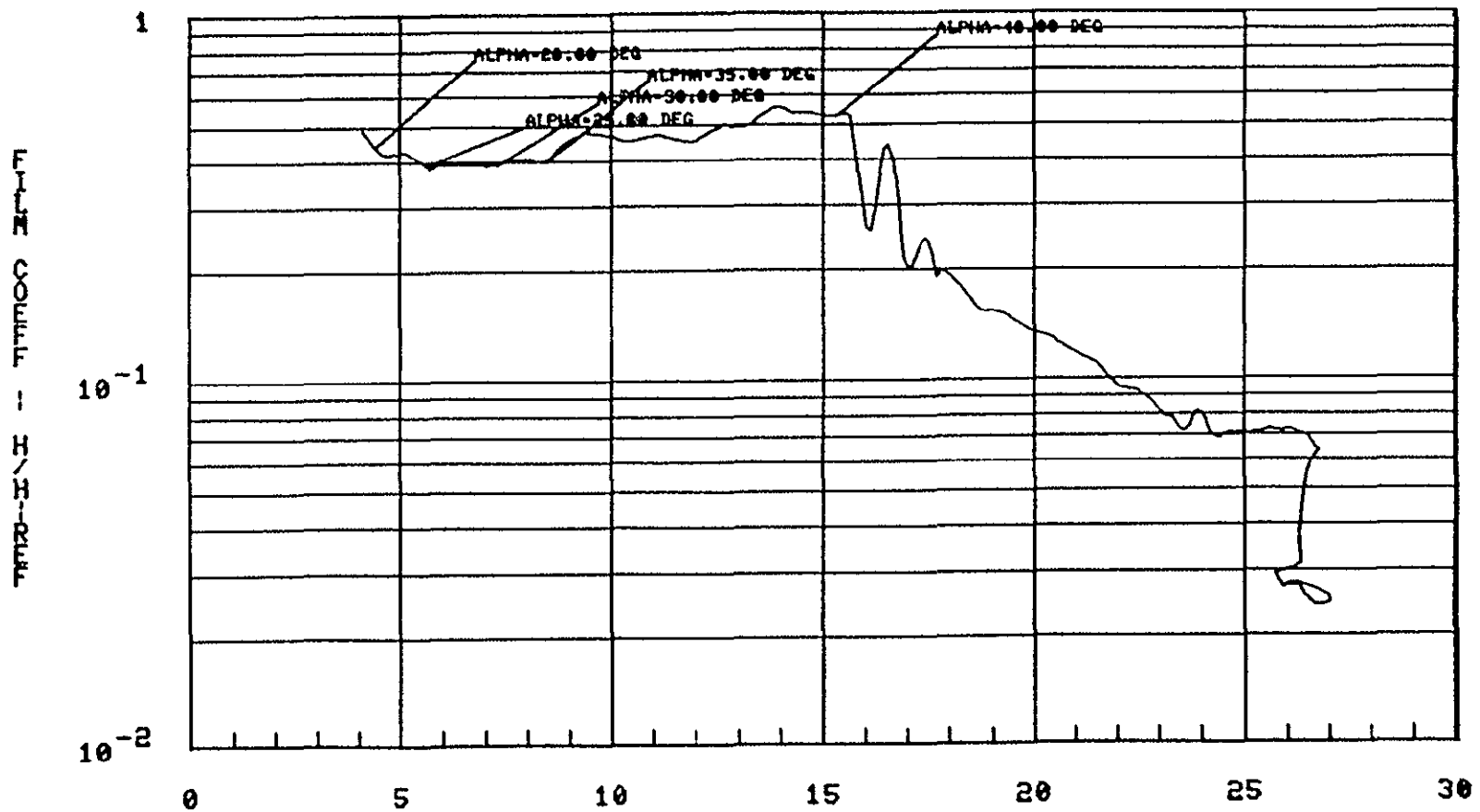


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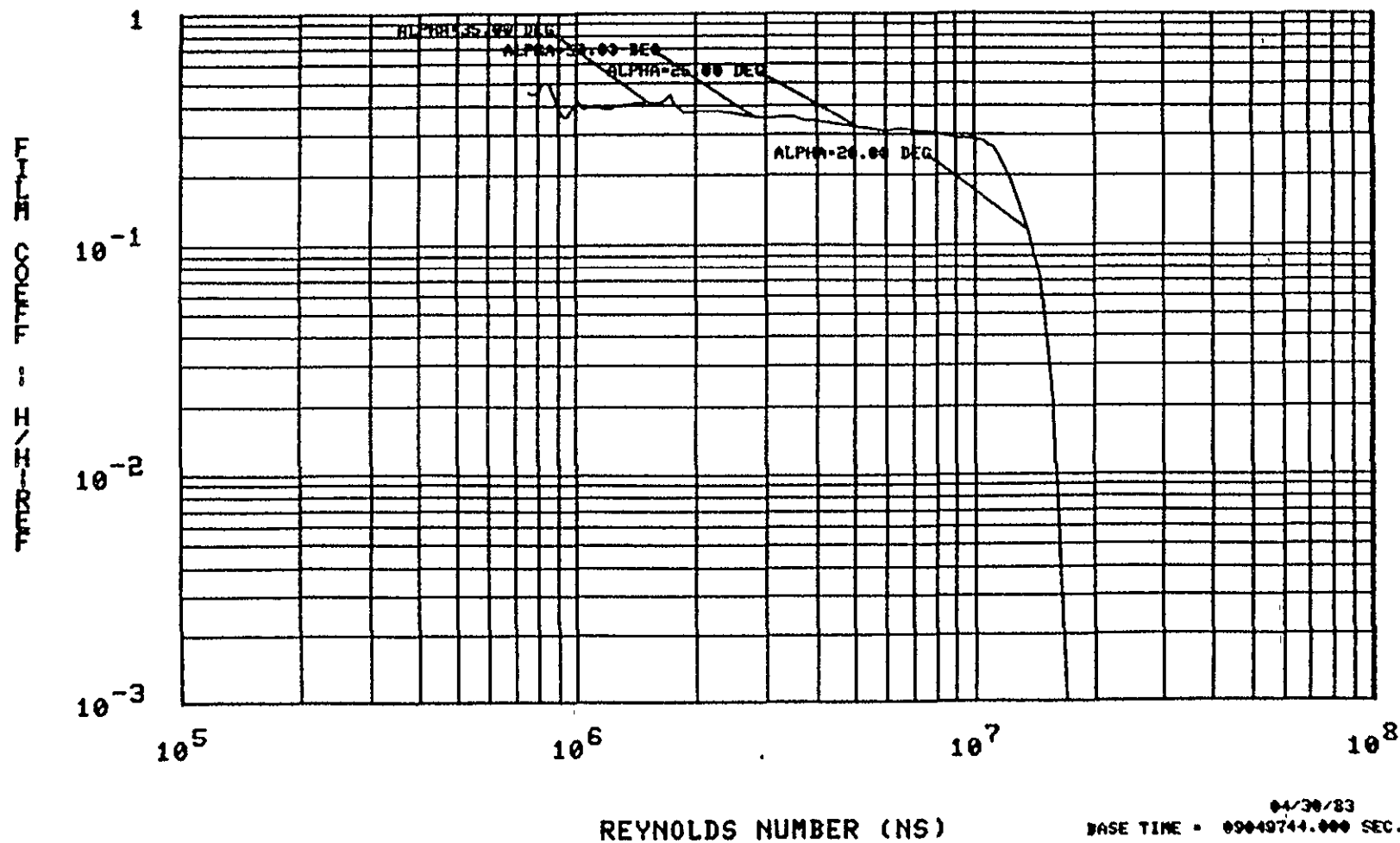
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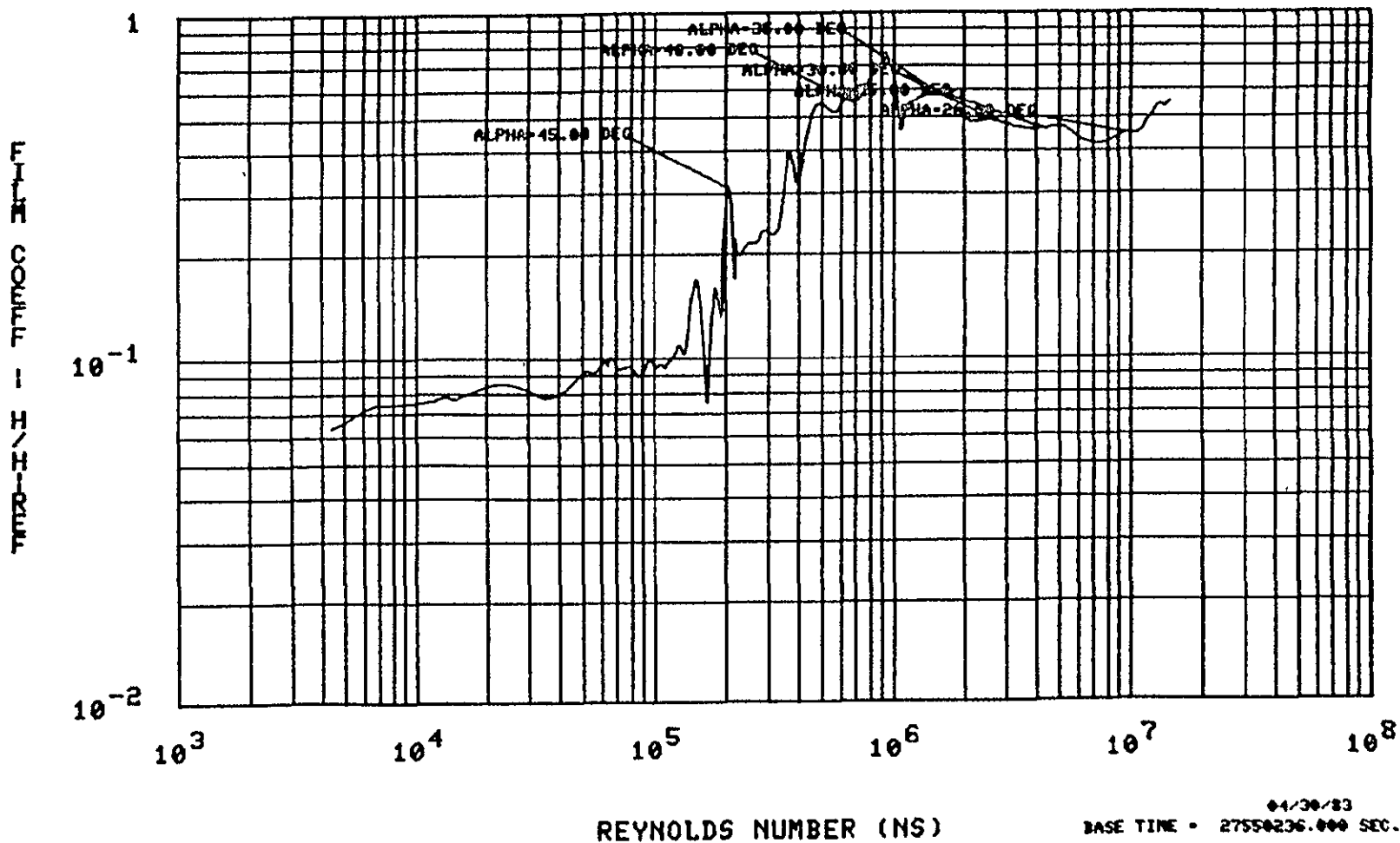
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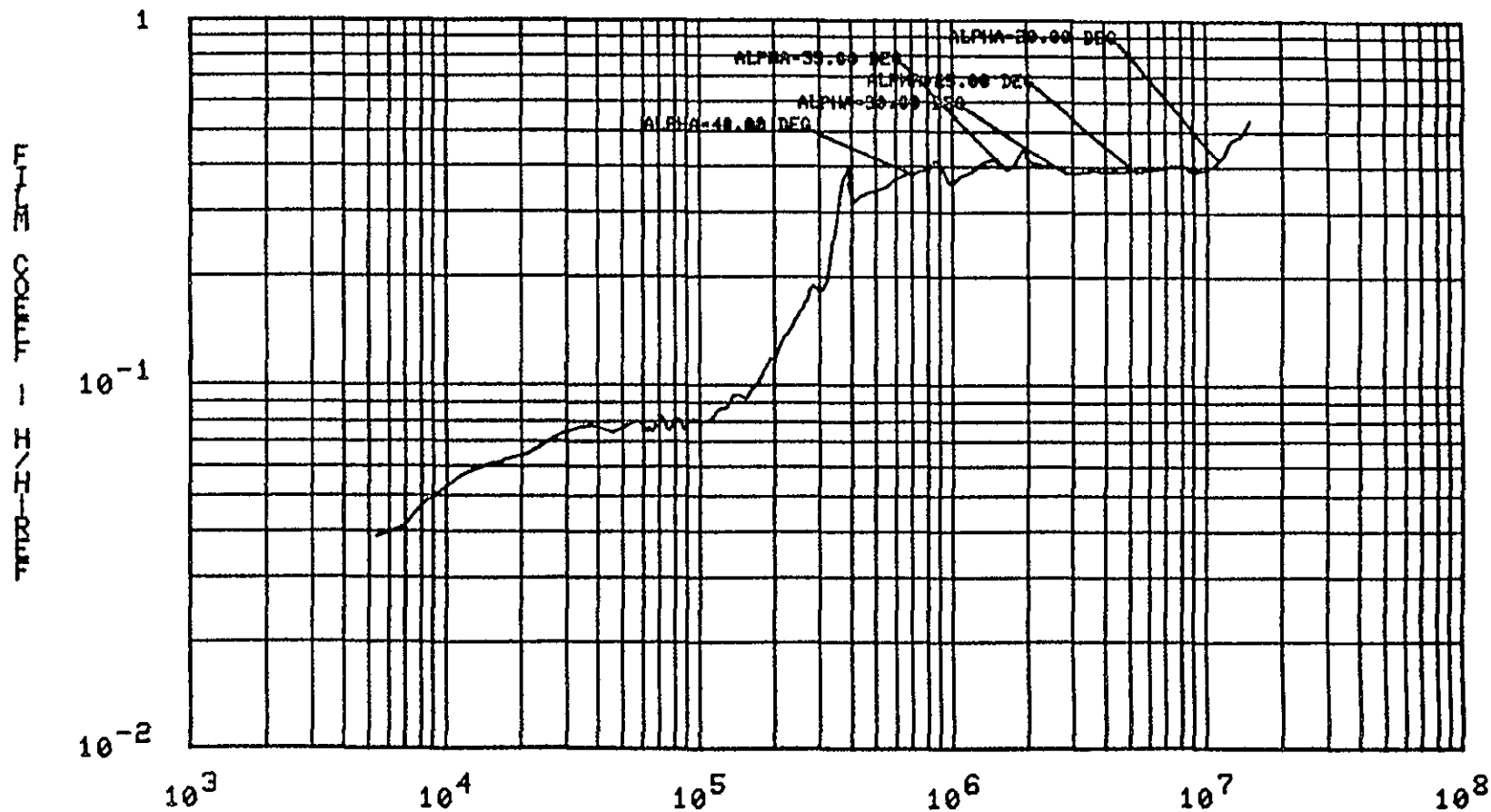
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U07T9502A/H-REF 200-1380 SEC



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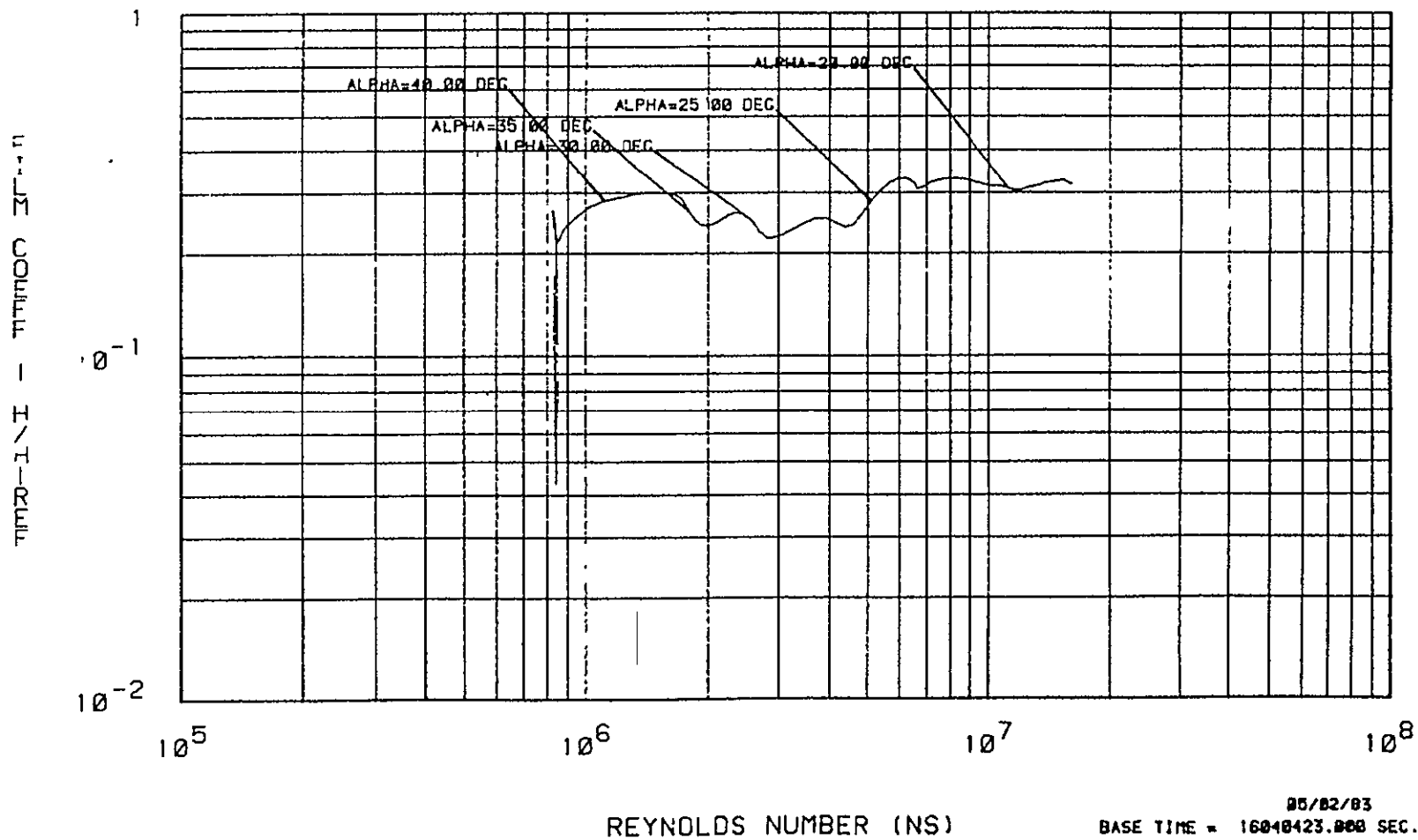
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B-438

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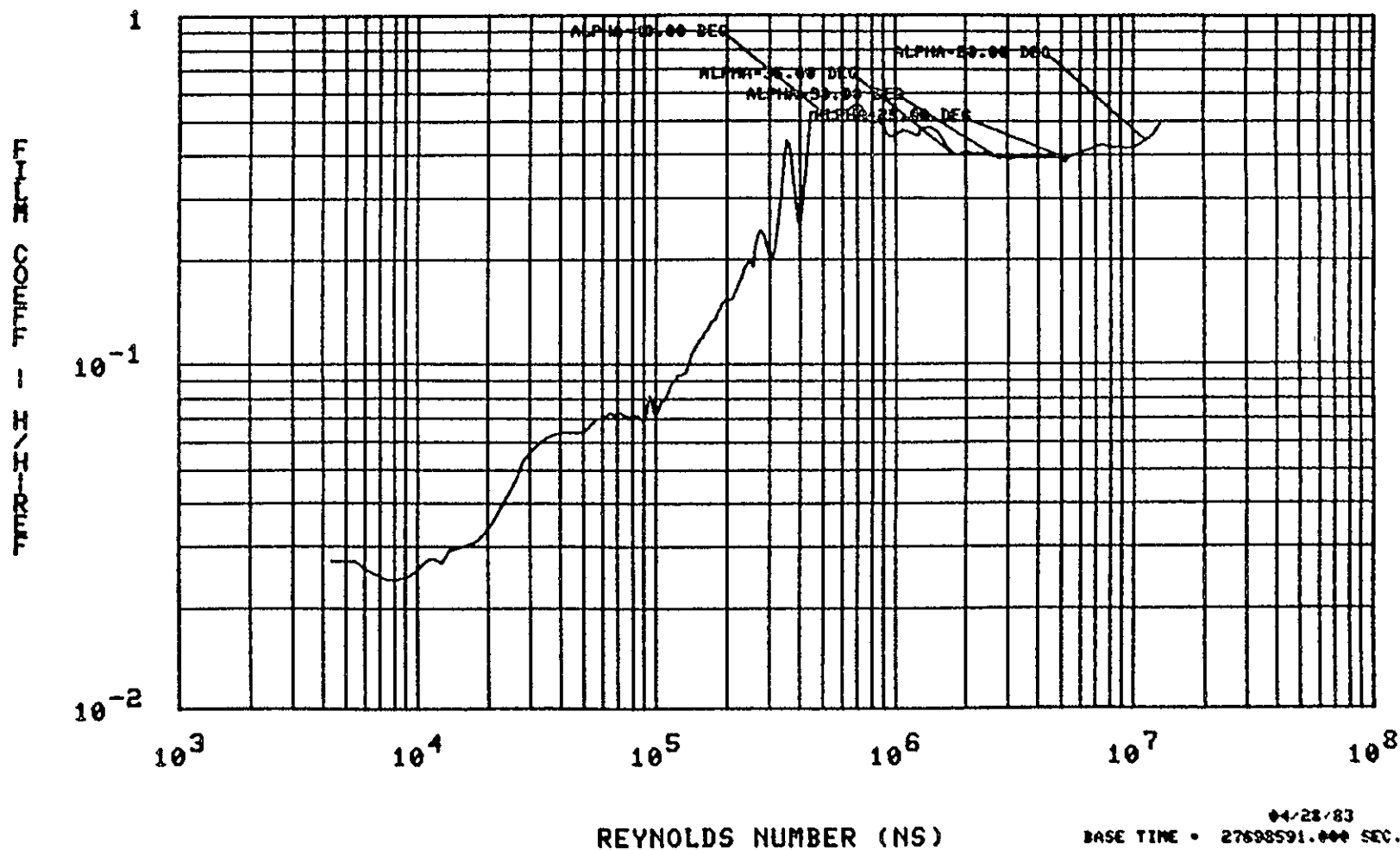


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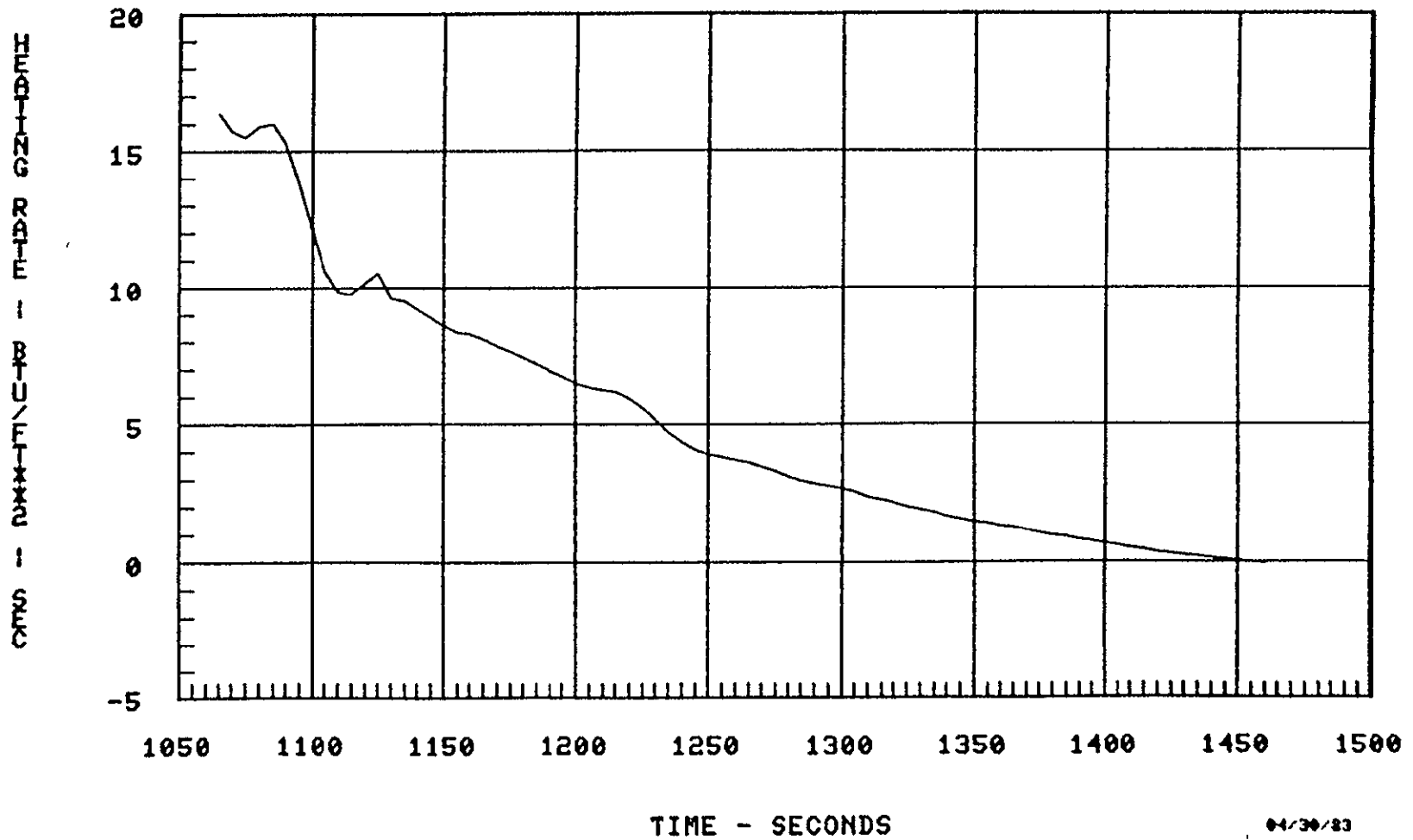
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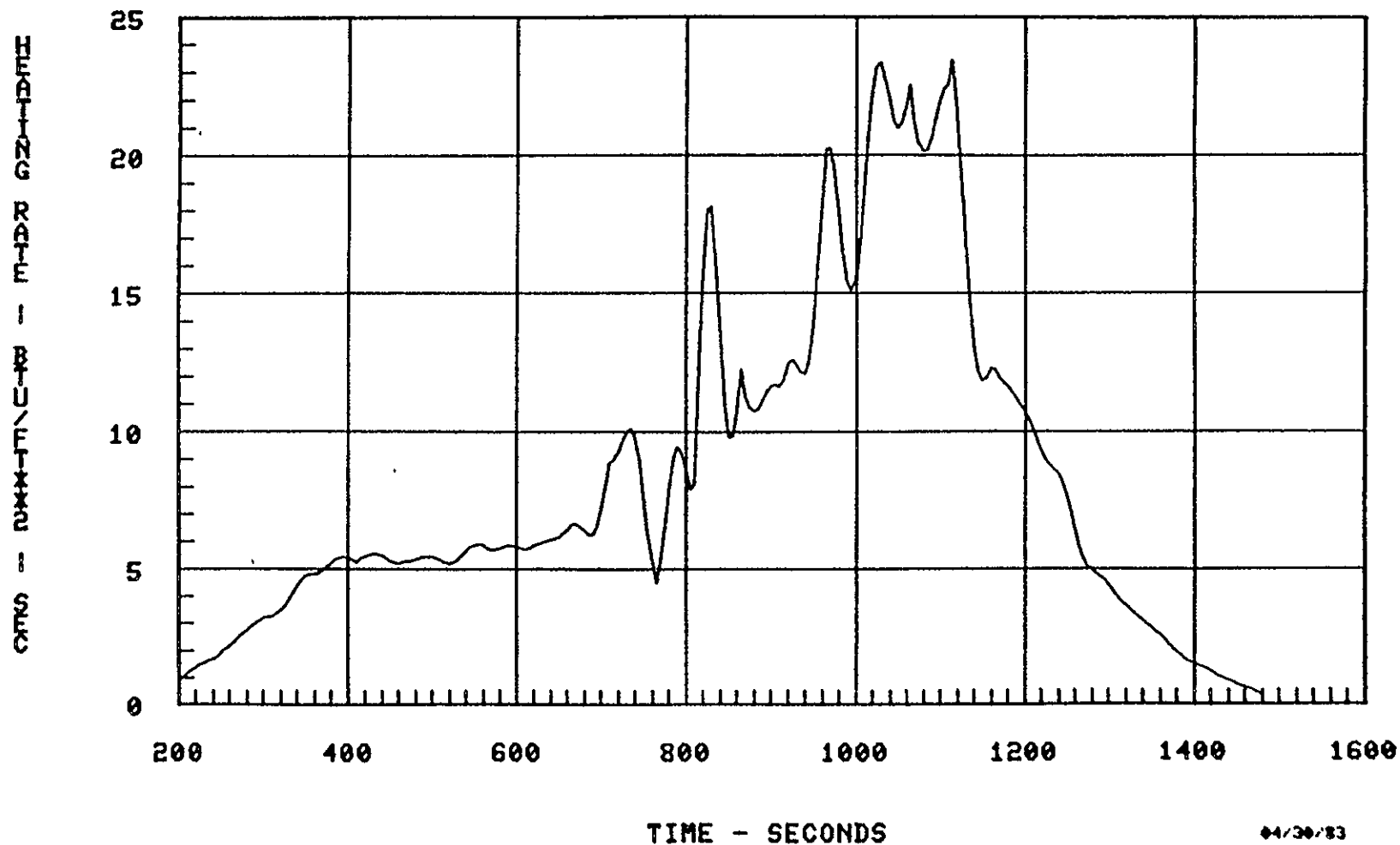
U07T9502A



B-441

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U07T9502A



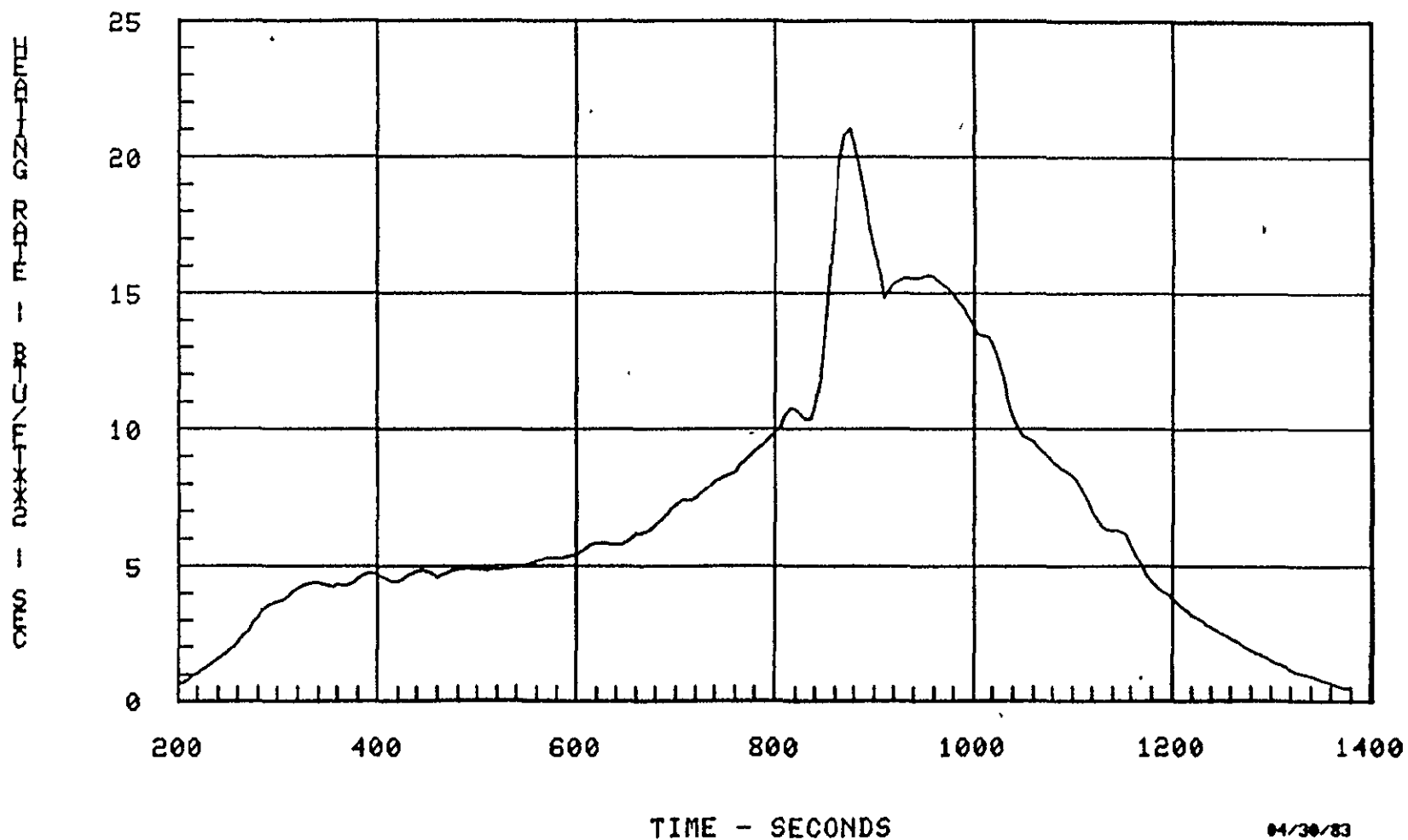
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B-442

04/30/83

STS-3 (107 FT LENGTH CL X/L=1.03) FLIGHT PARAMETER COMPARISO

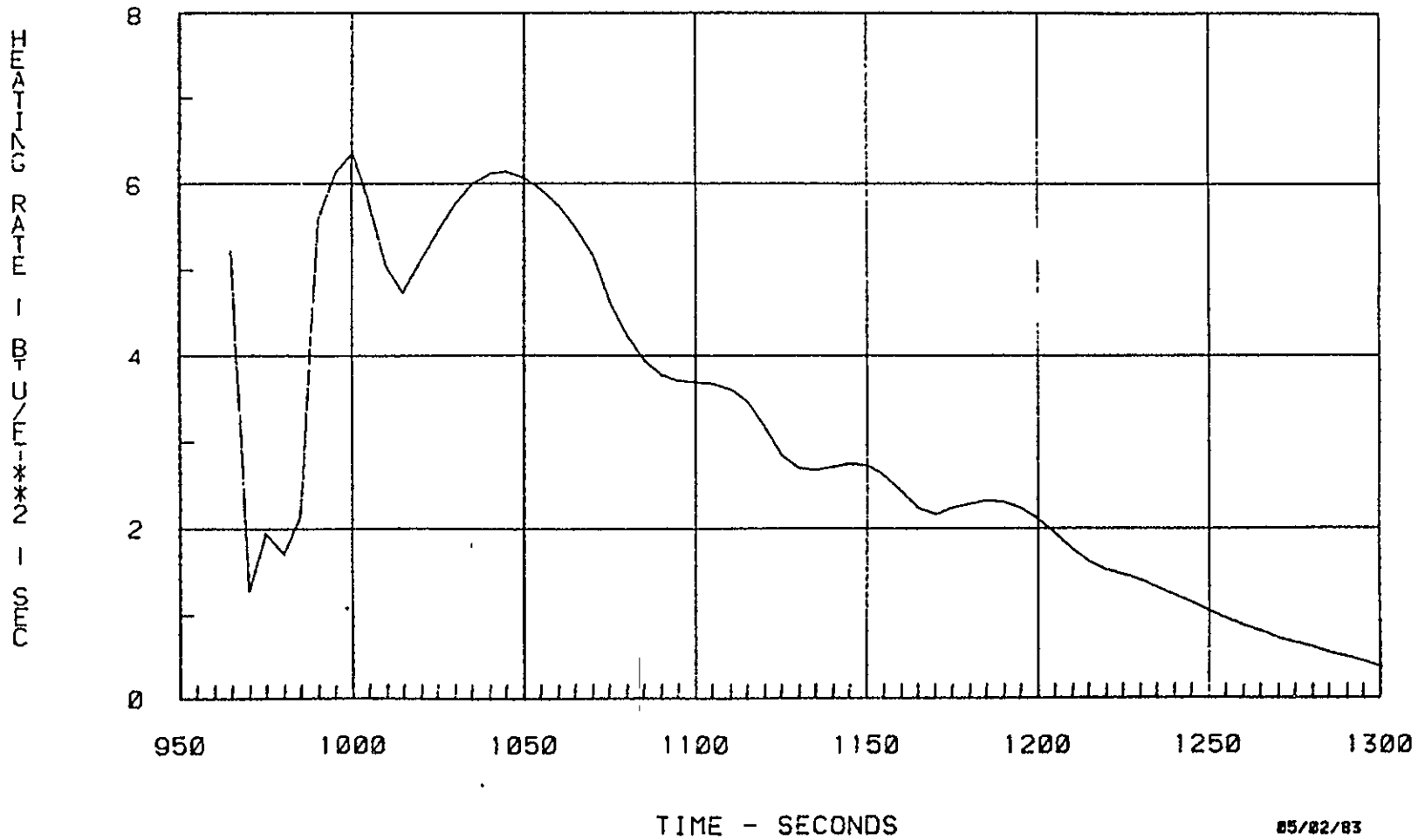
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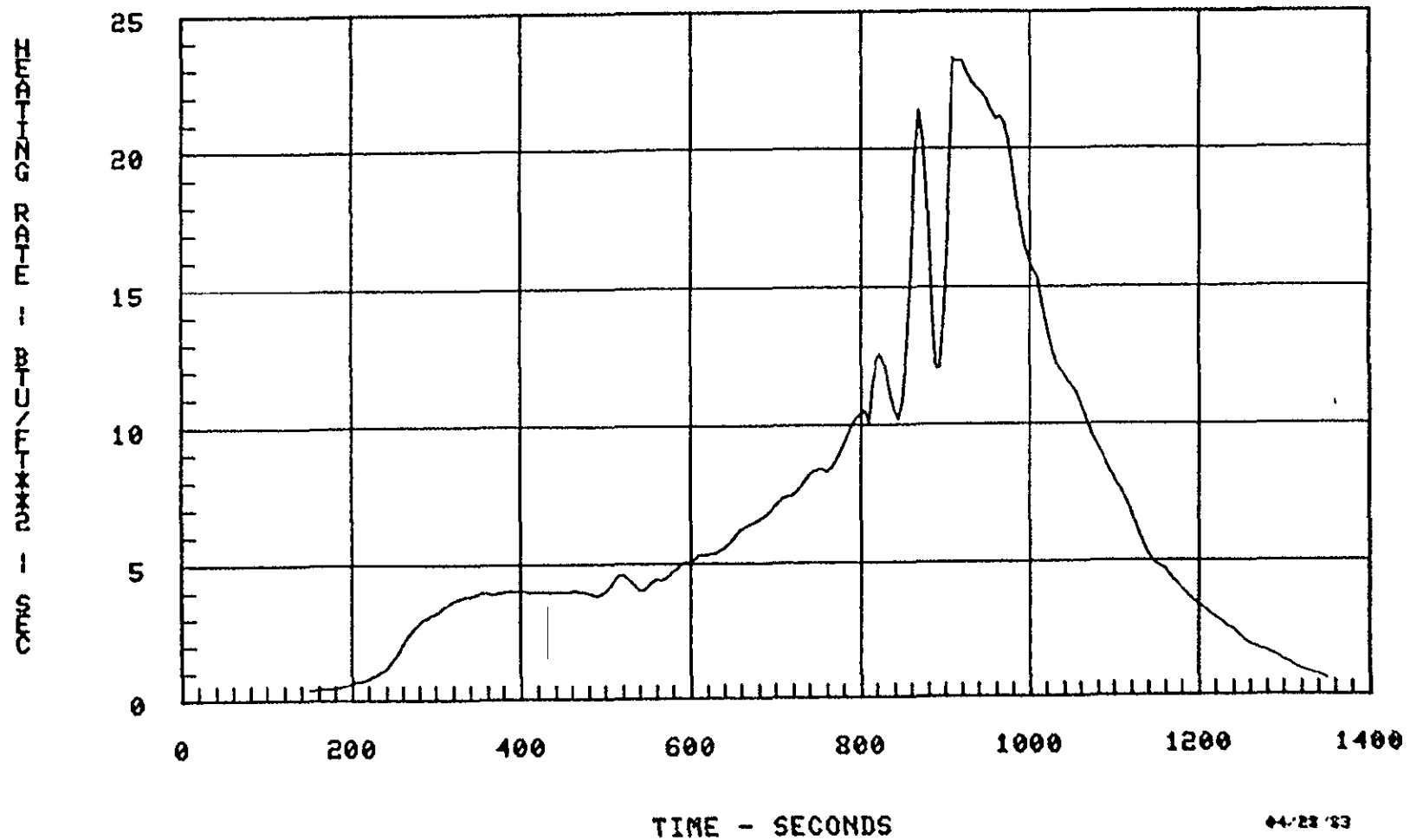
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05/02/83

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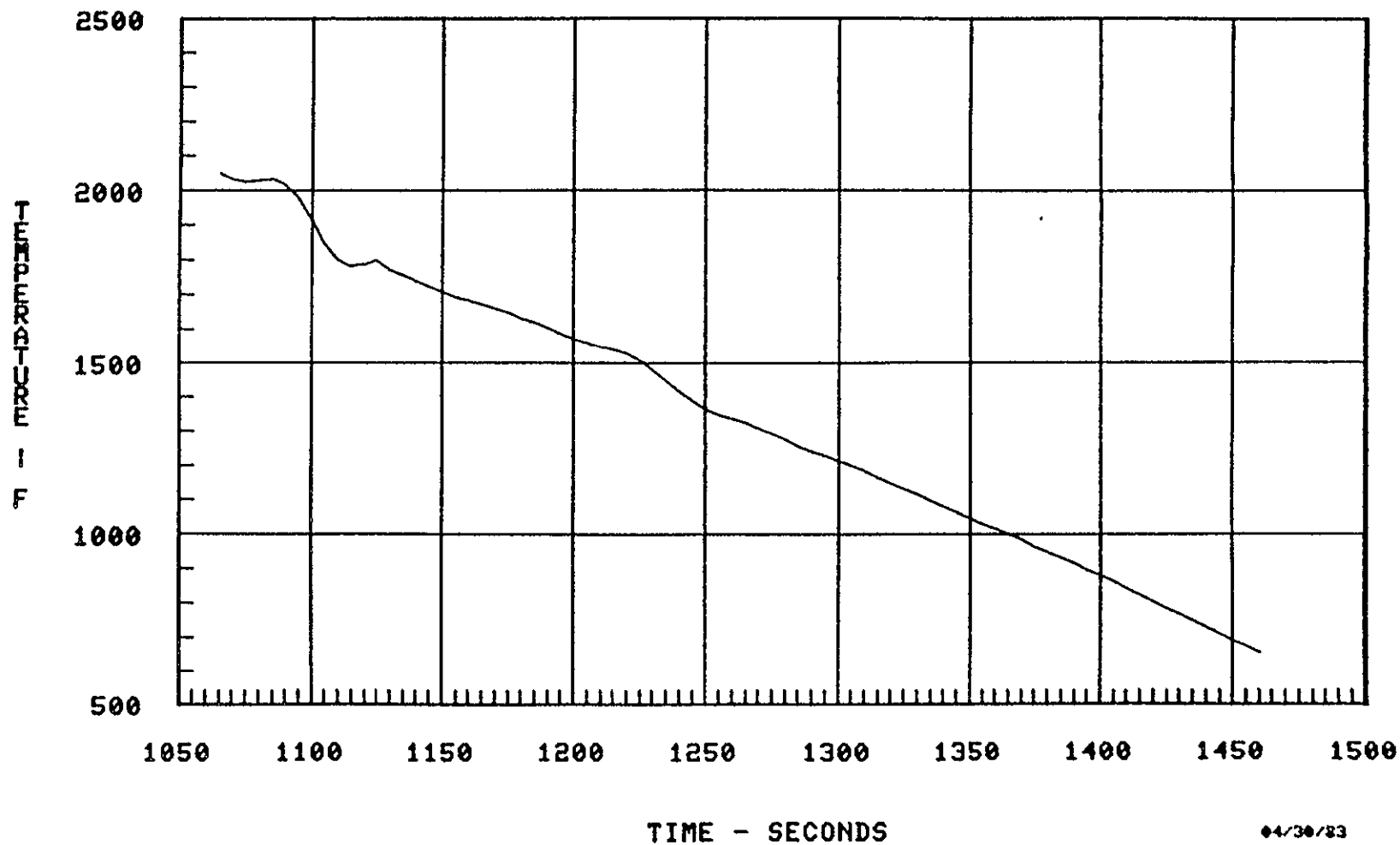
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04/23/83

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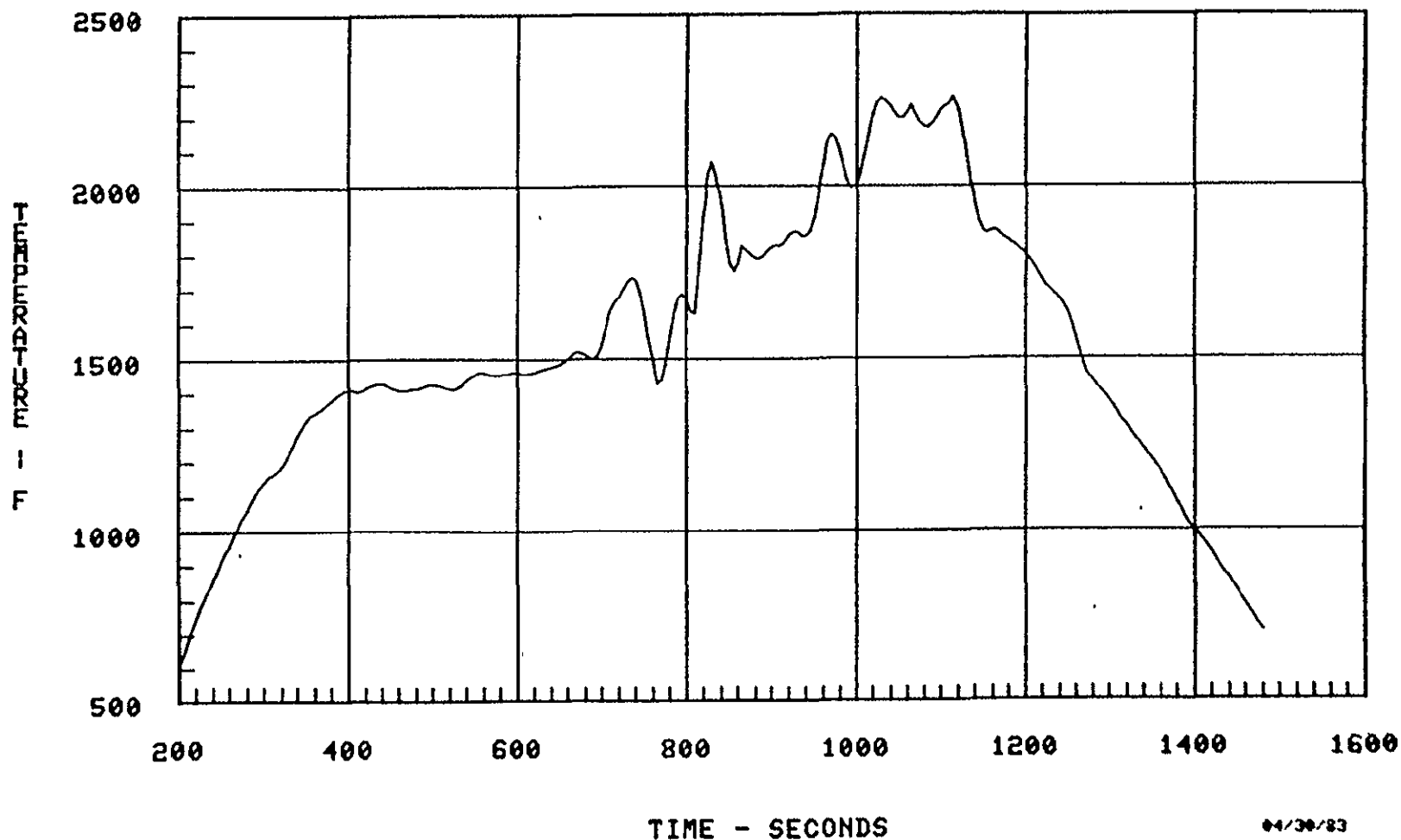
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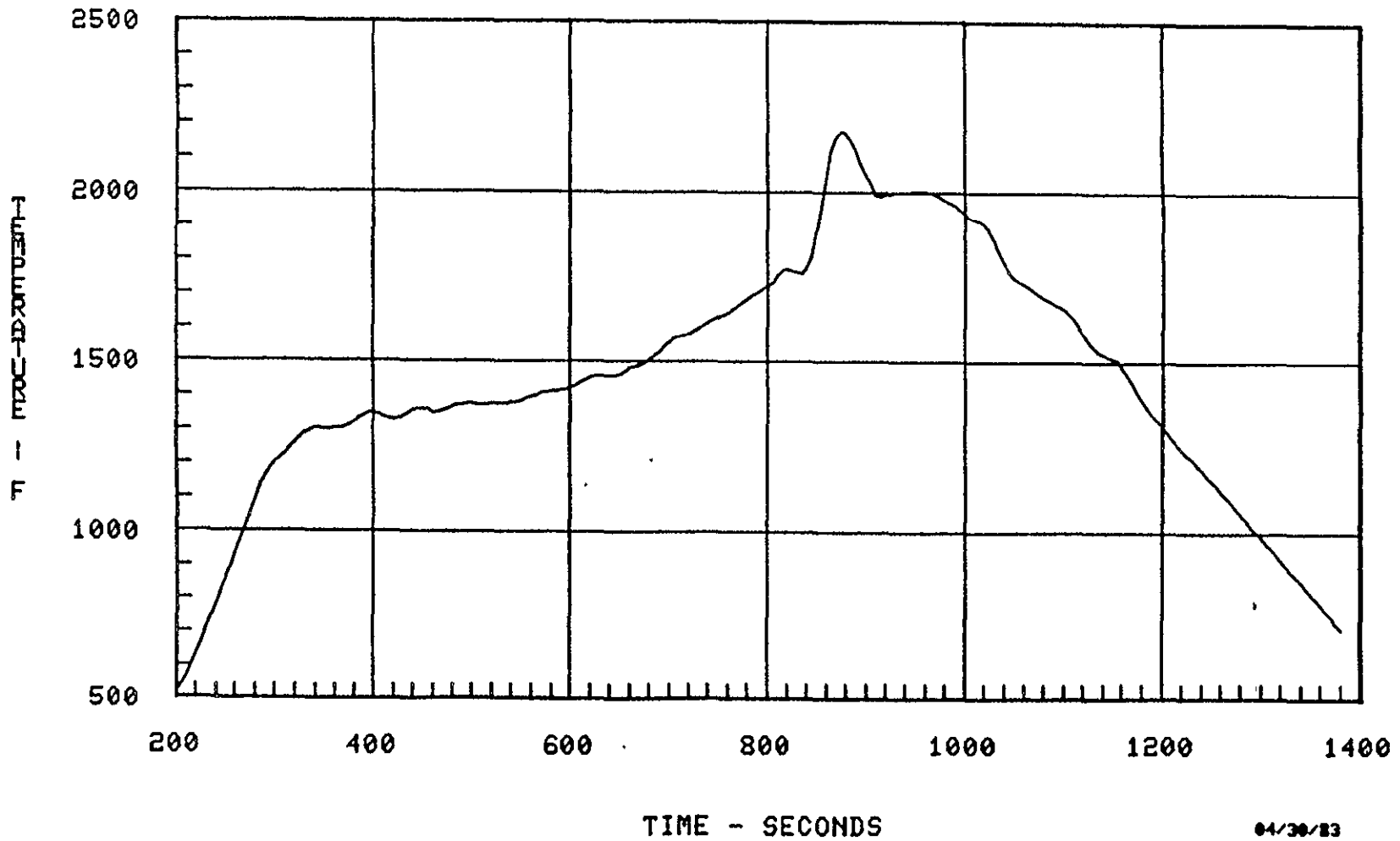
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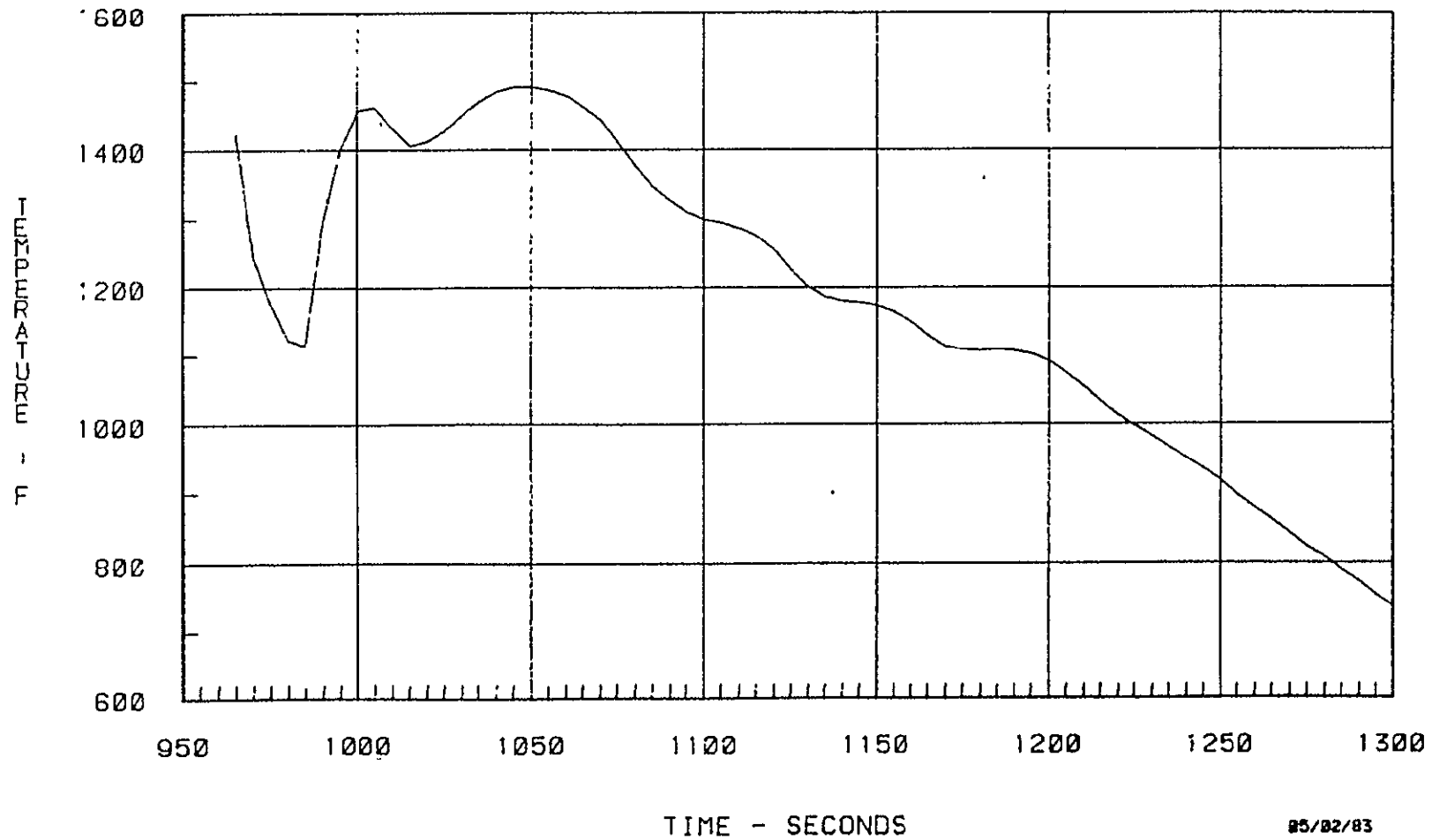
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STS-4 (107 FT LENGTH CL  $X/L=1.03$ ) FLIGHT PARAMETER COMPARISON

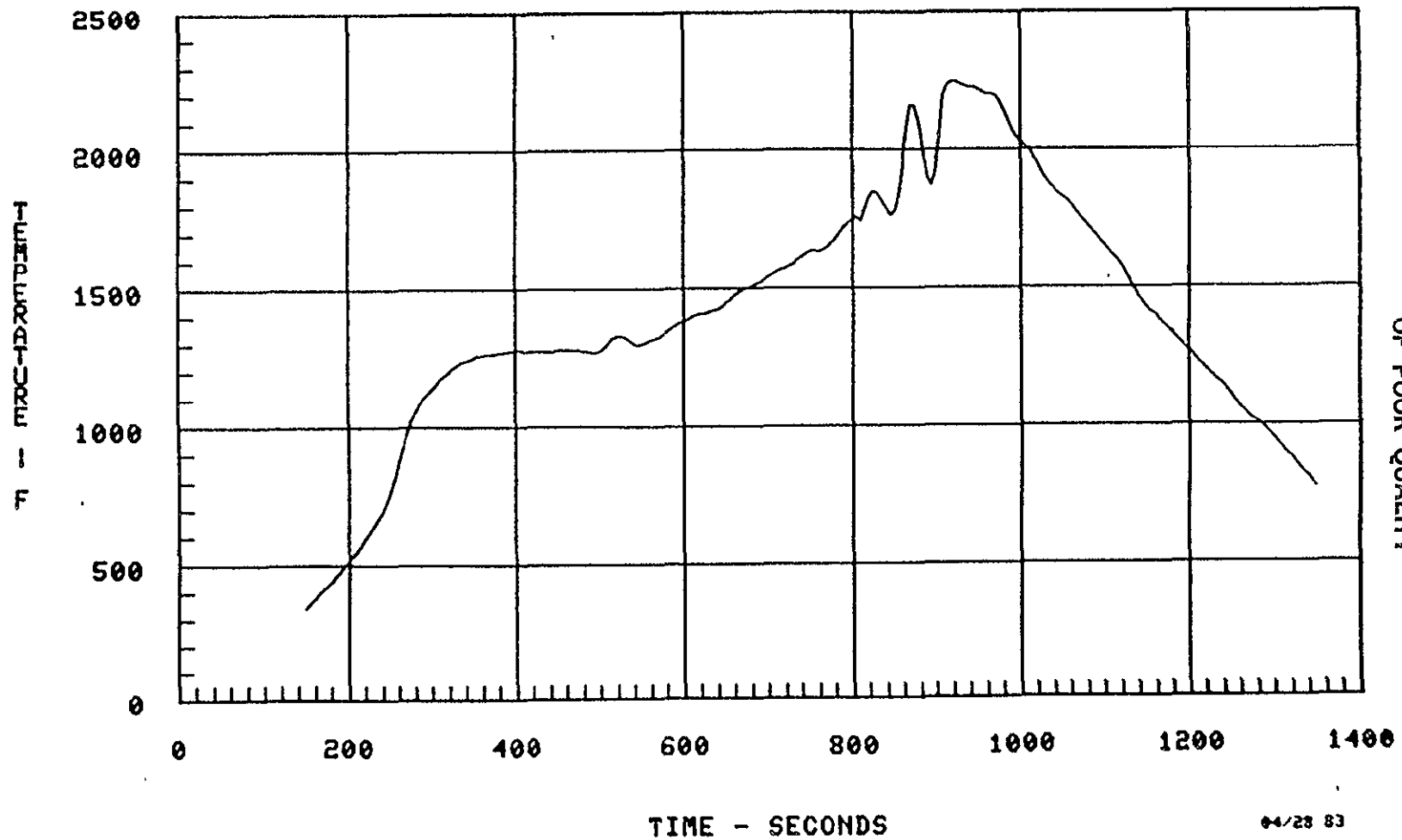
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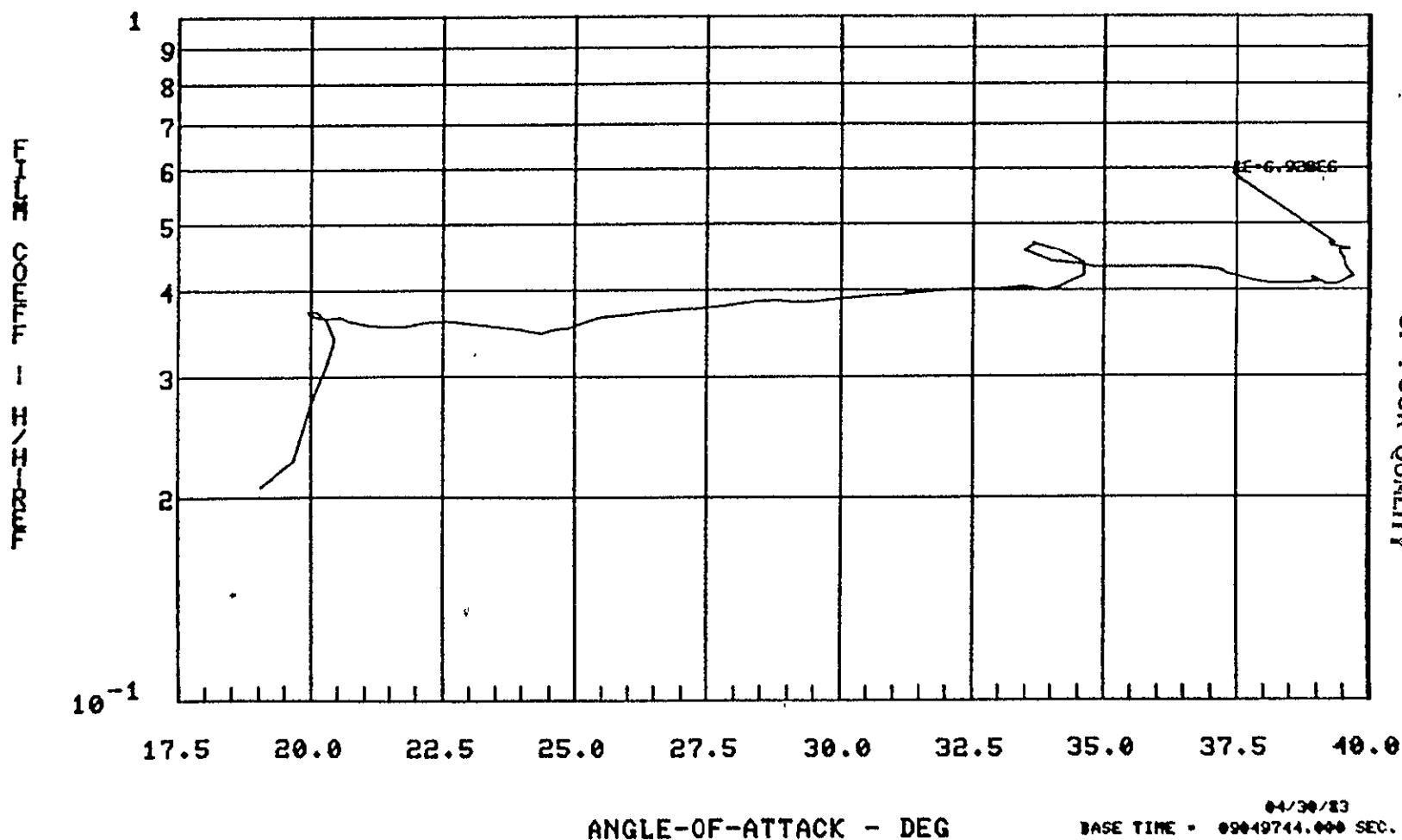
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# STS-1 (107 FT LENGTH CL X/L=1.07) FLIGHT PARAMETER COMPARISO

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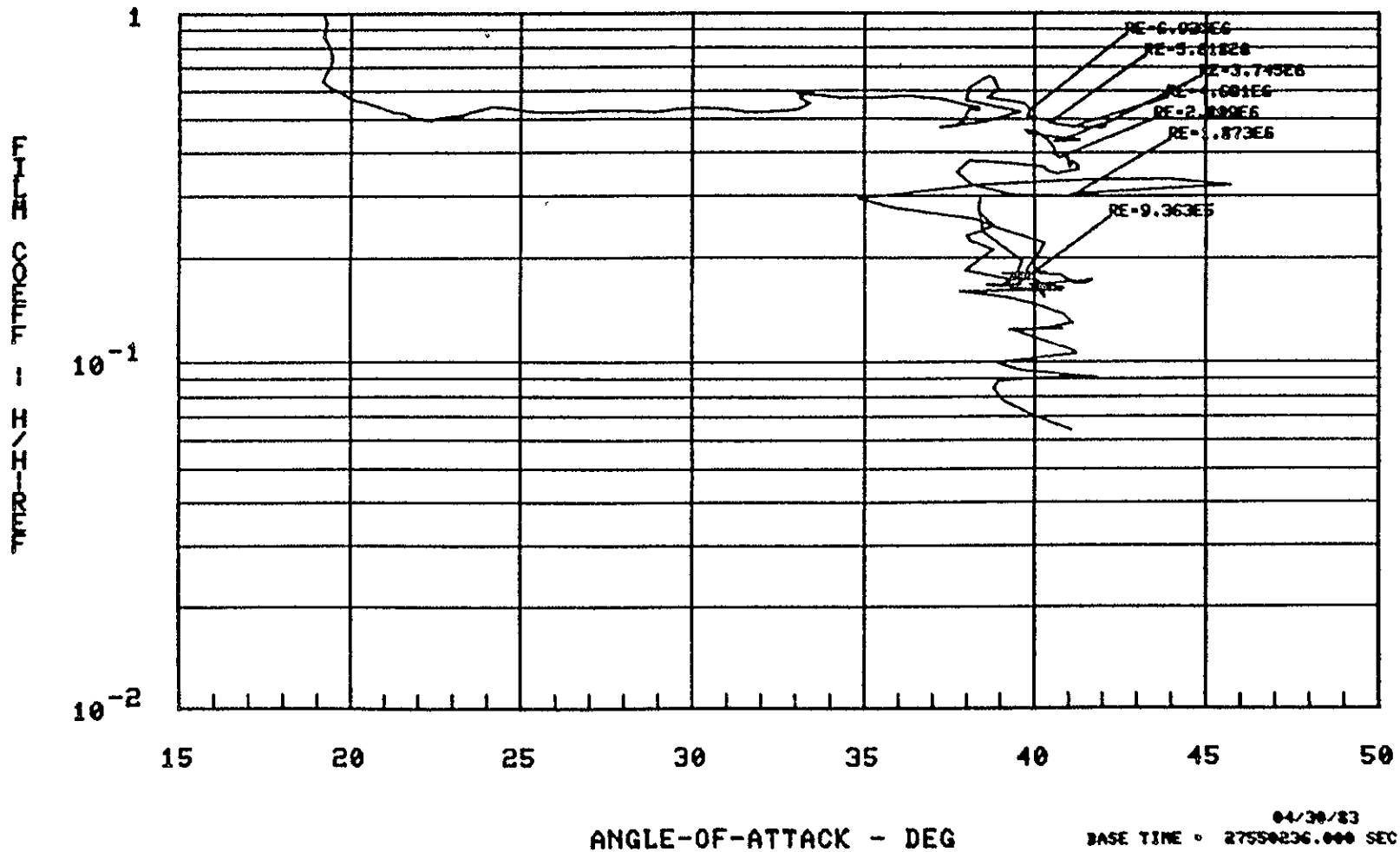
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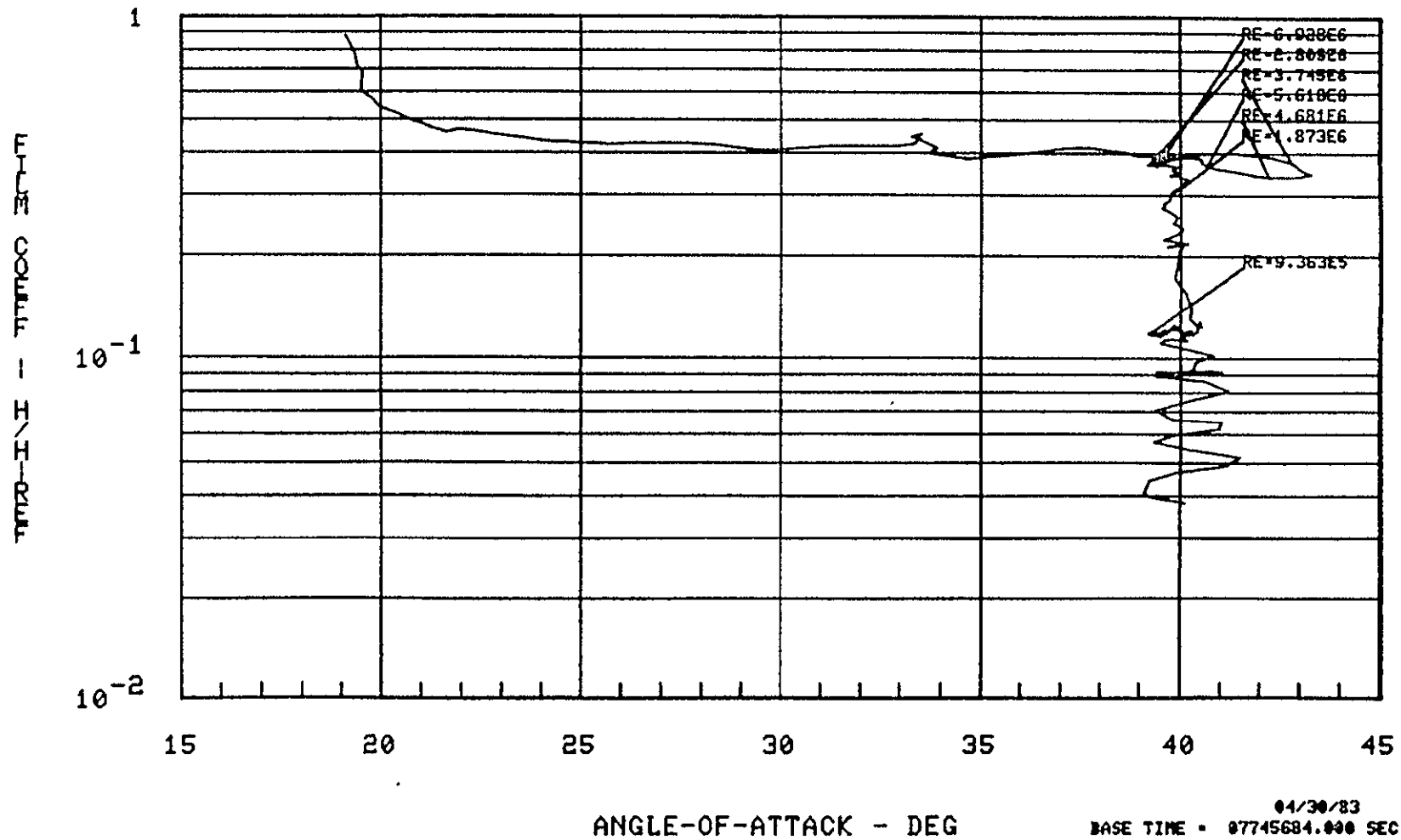
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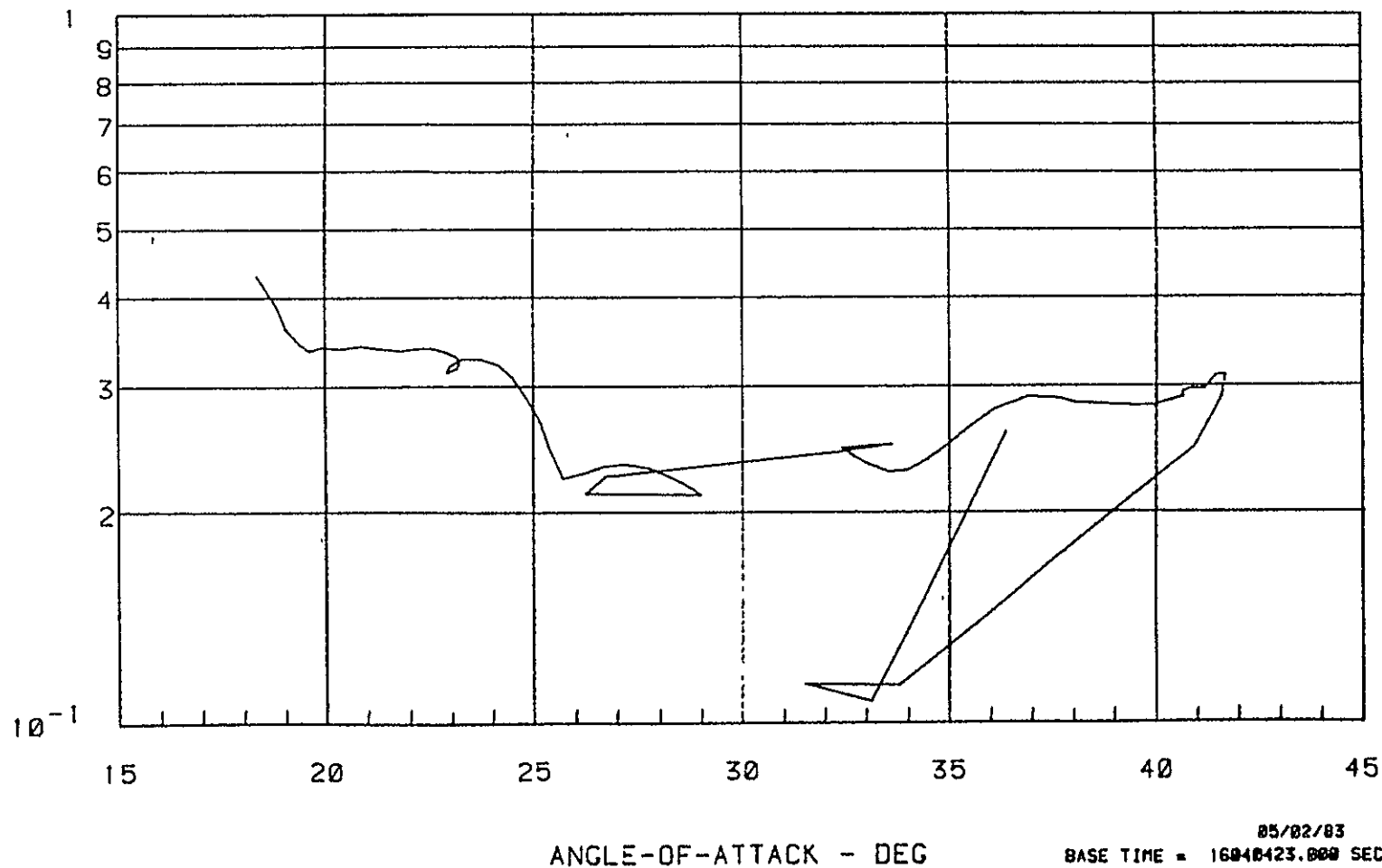
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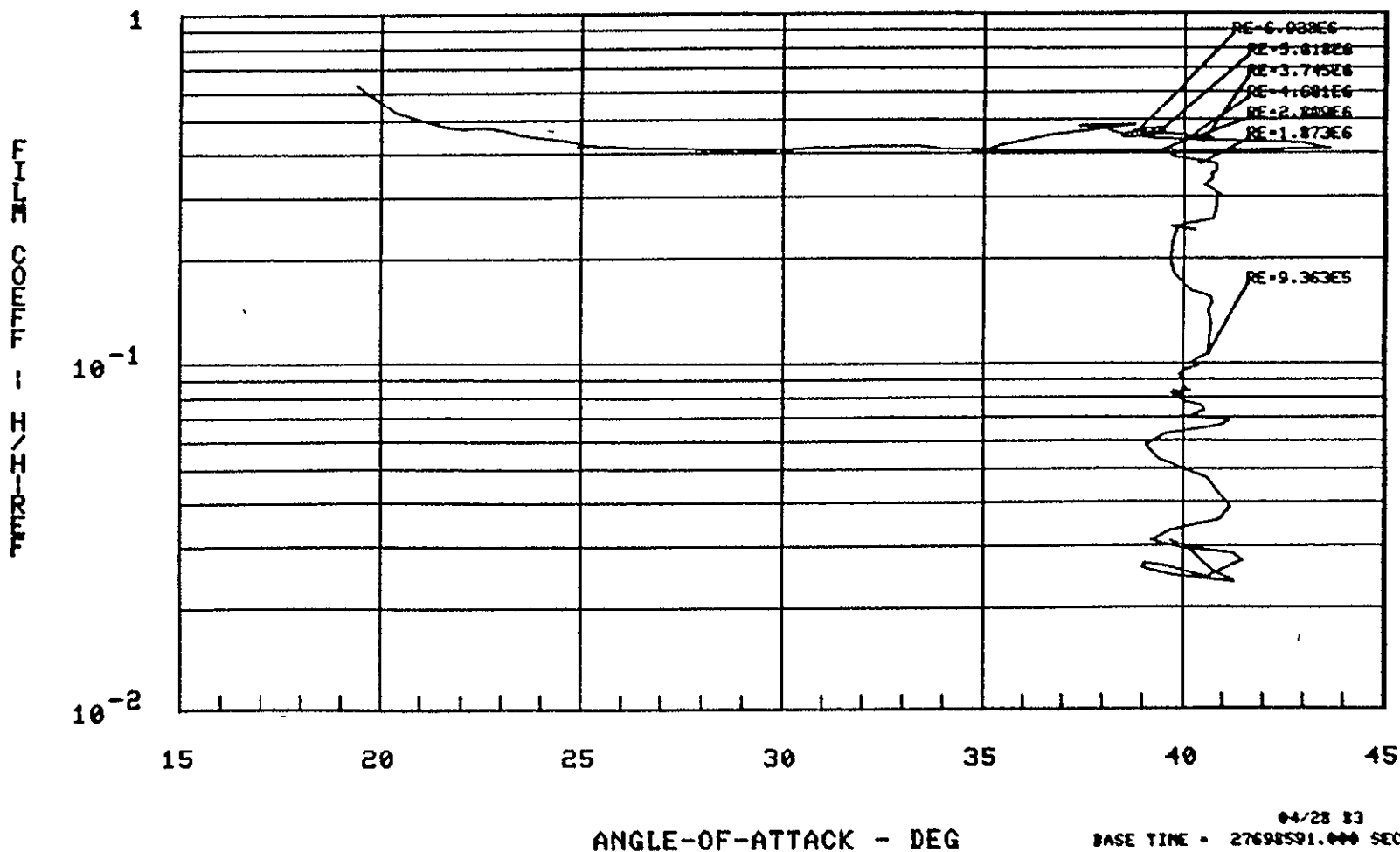
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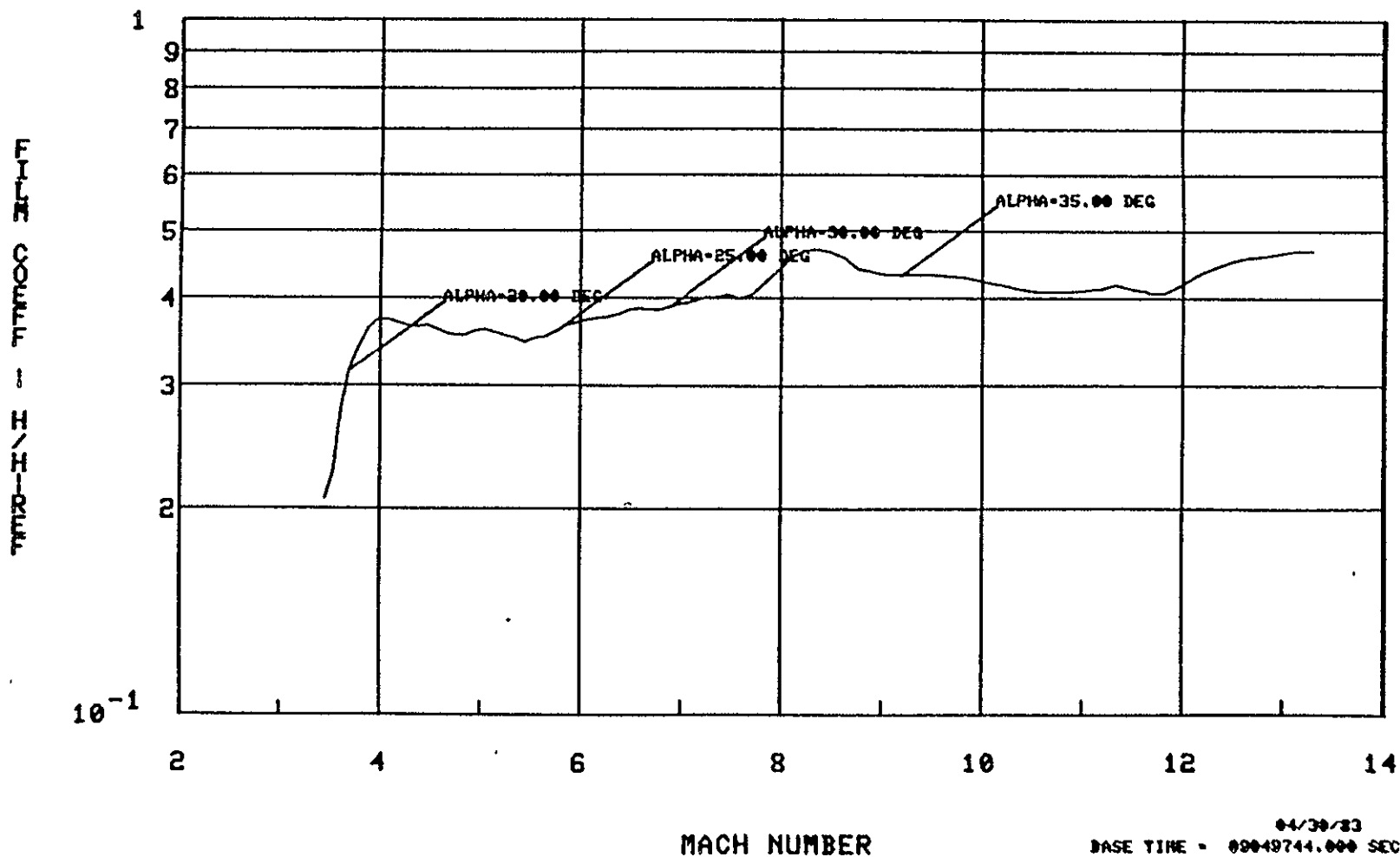


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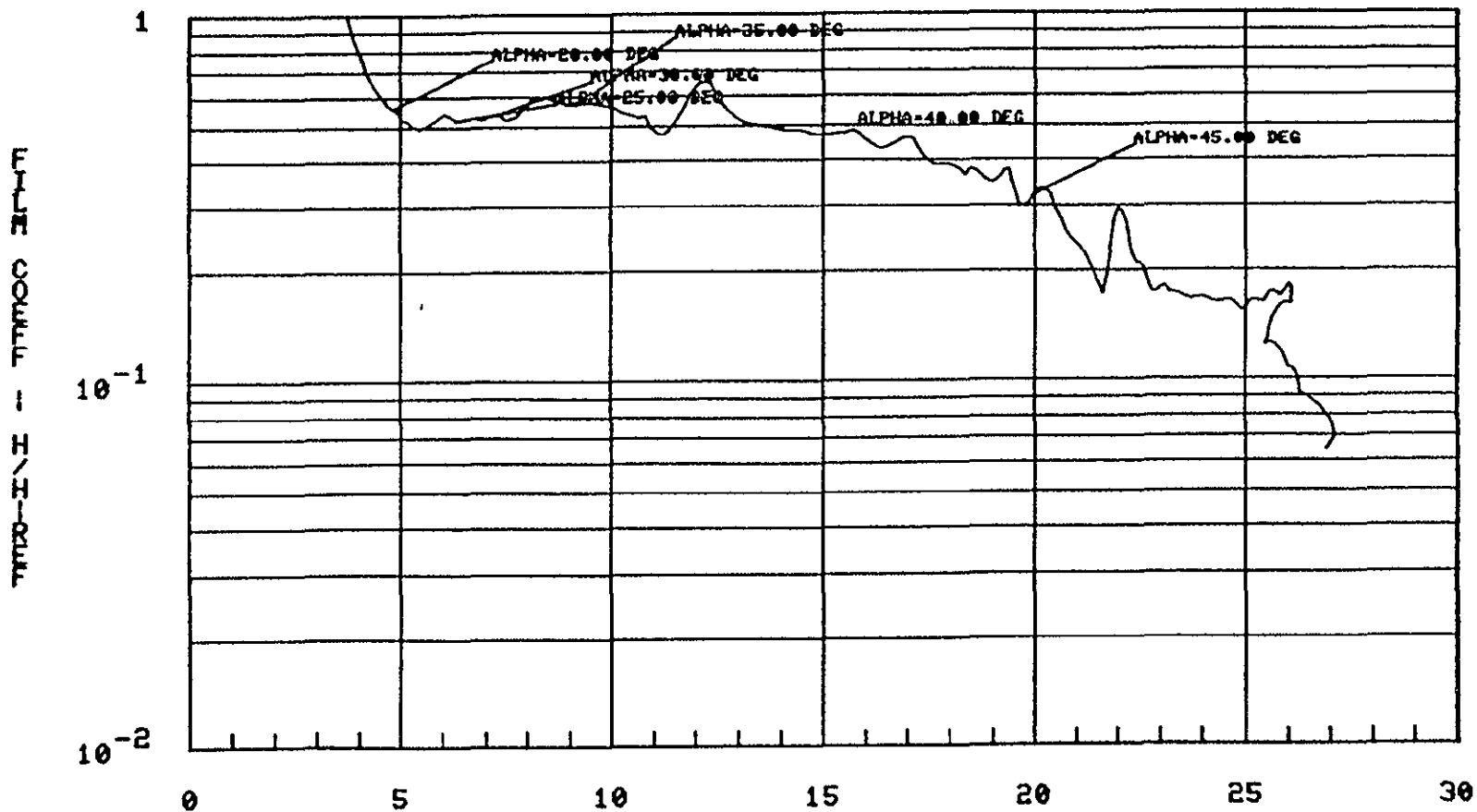
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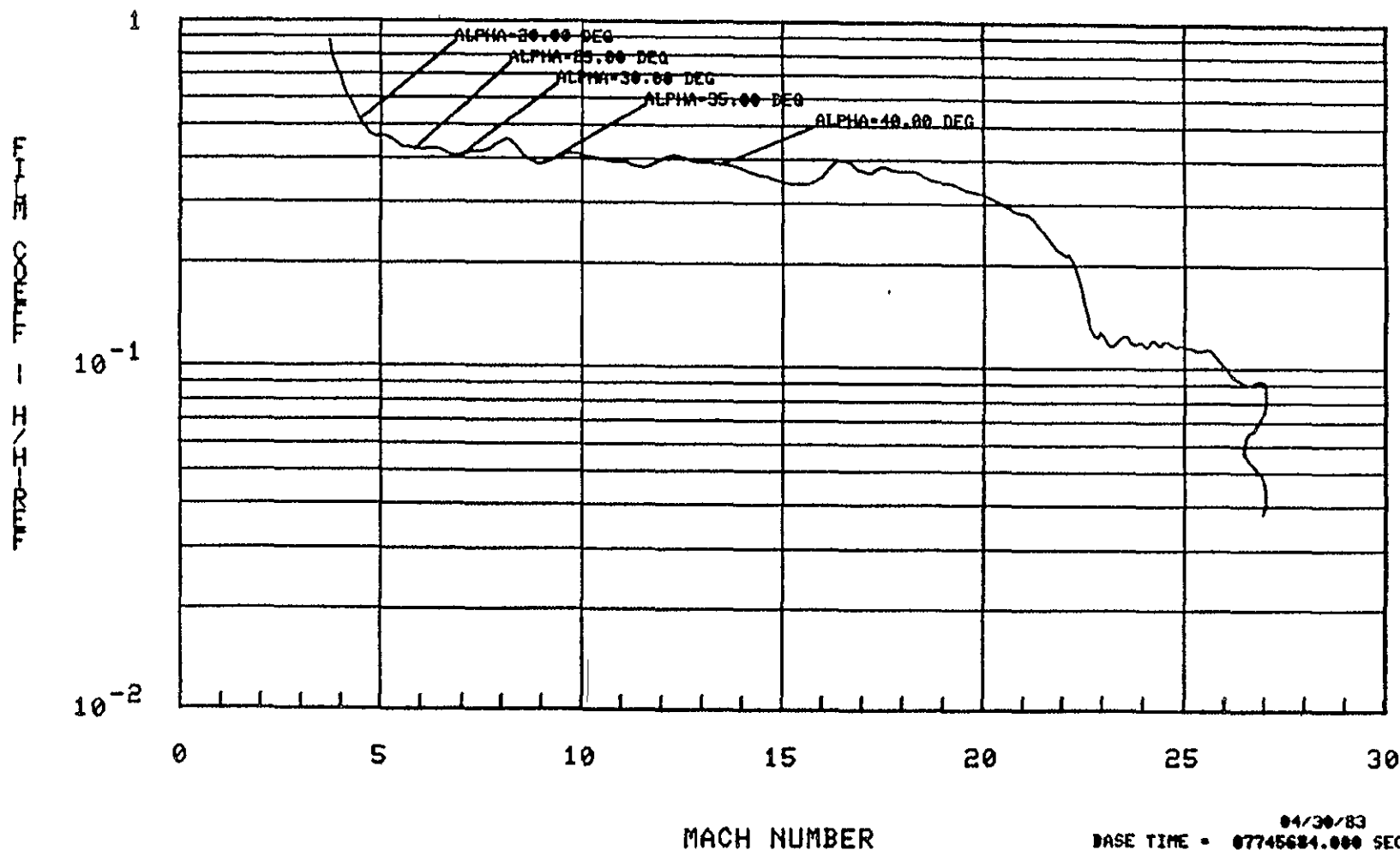
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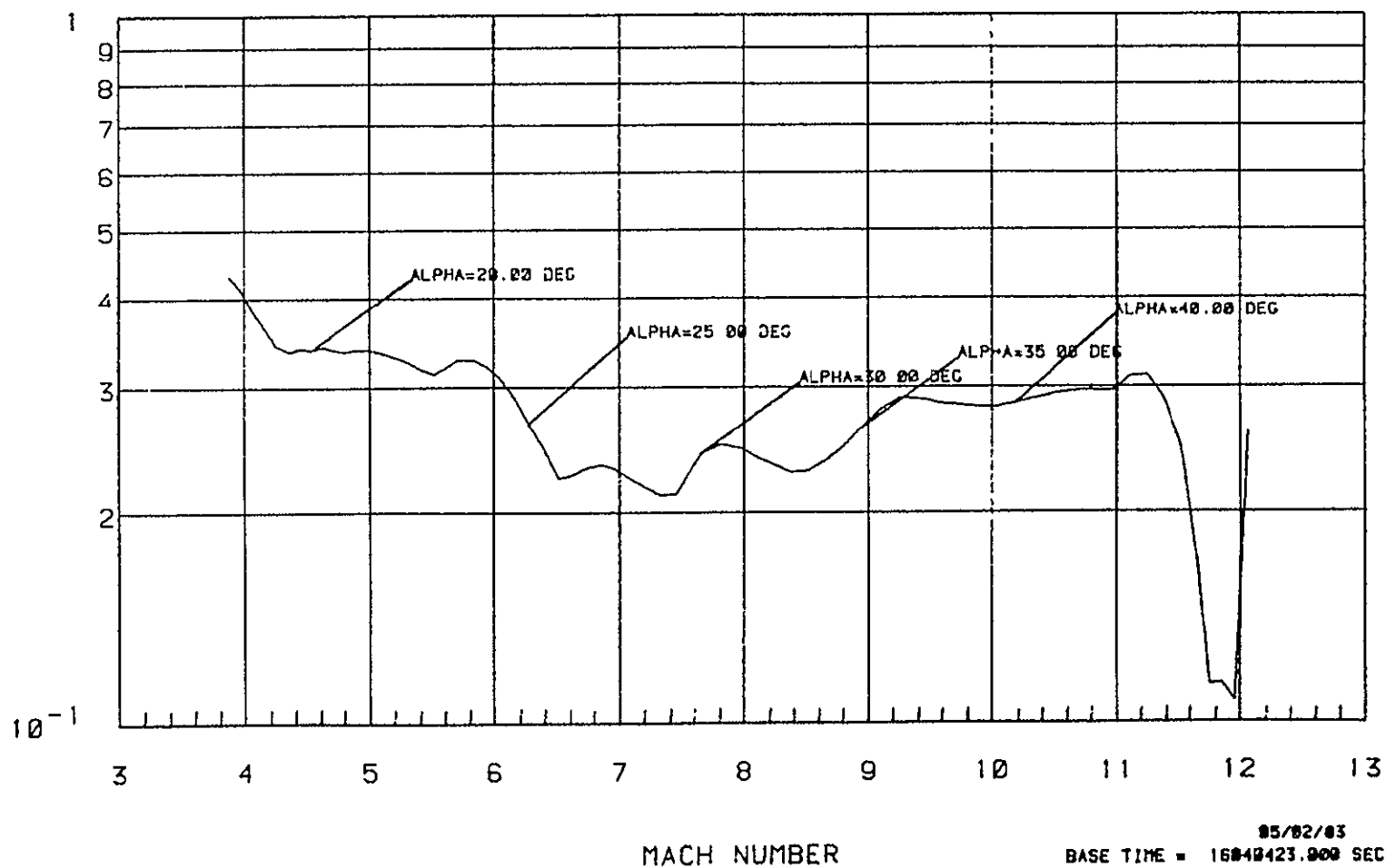
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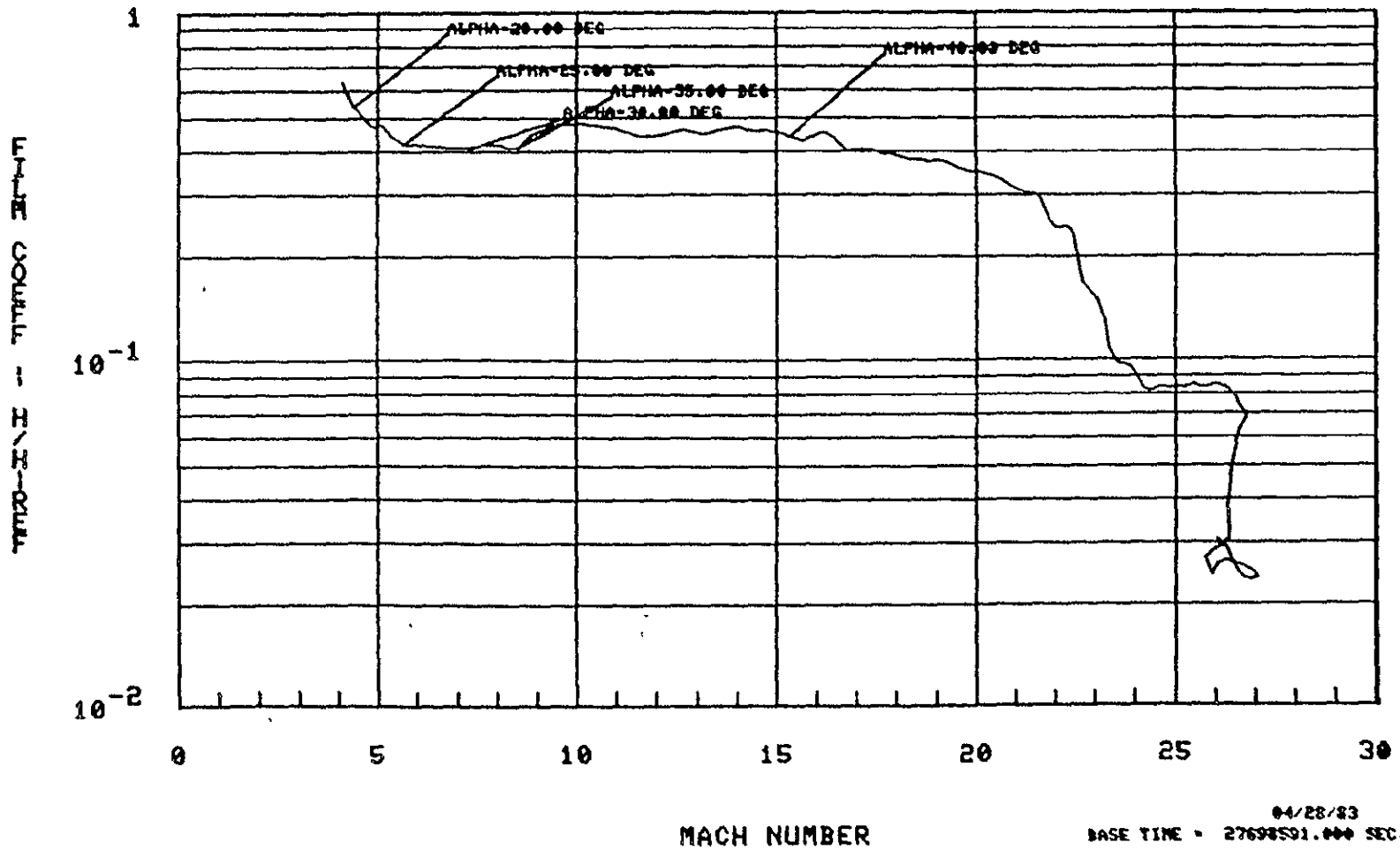
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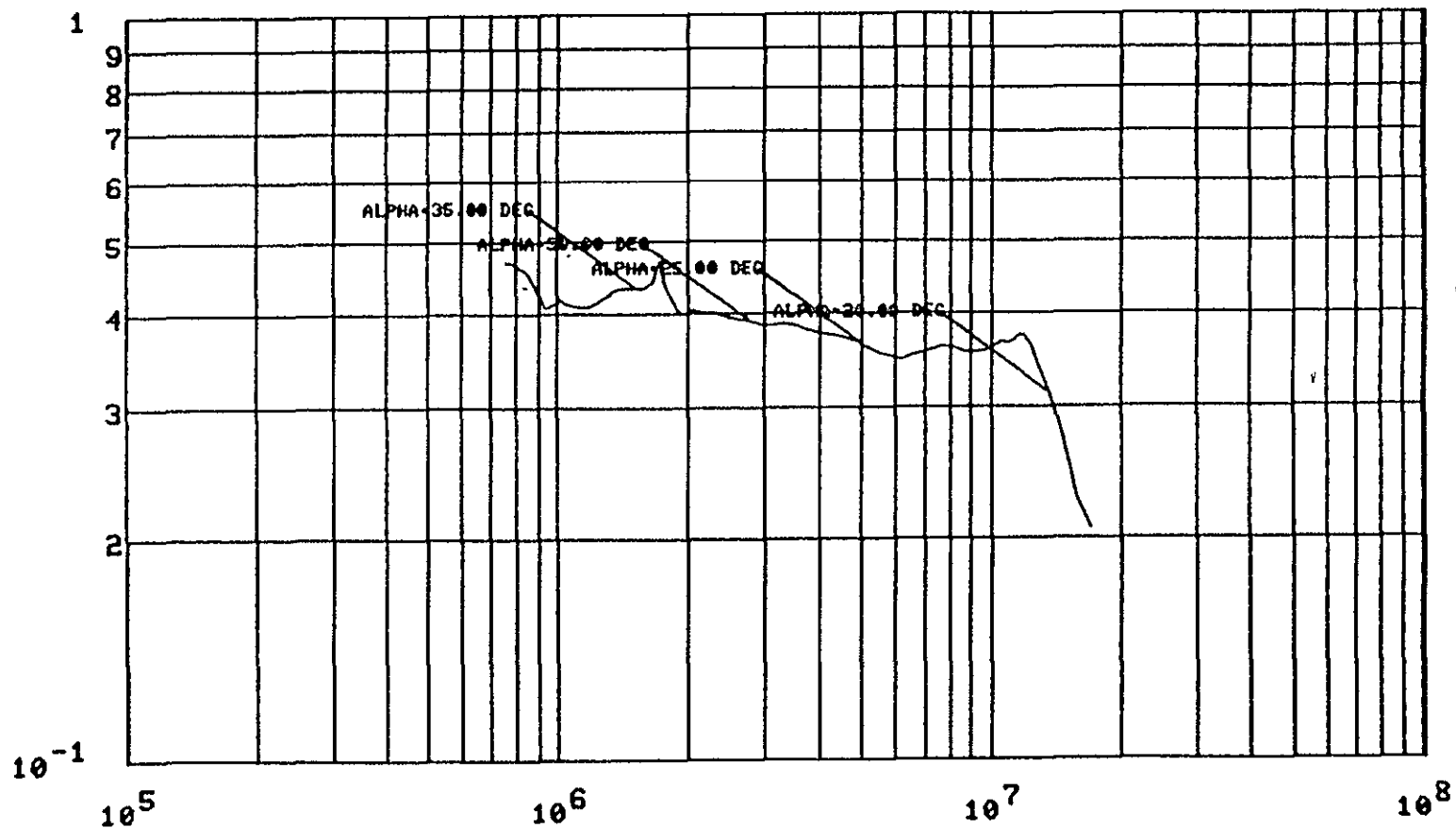


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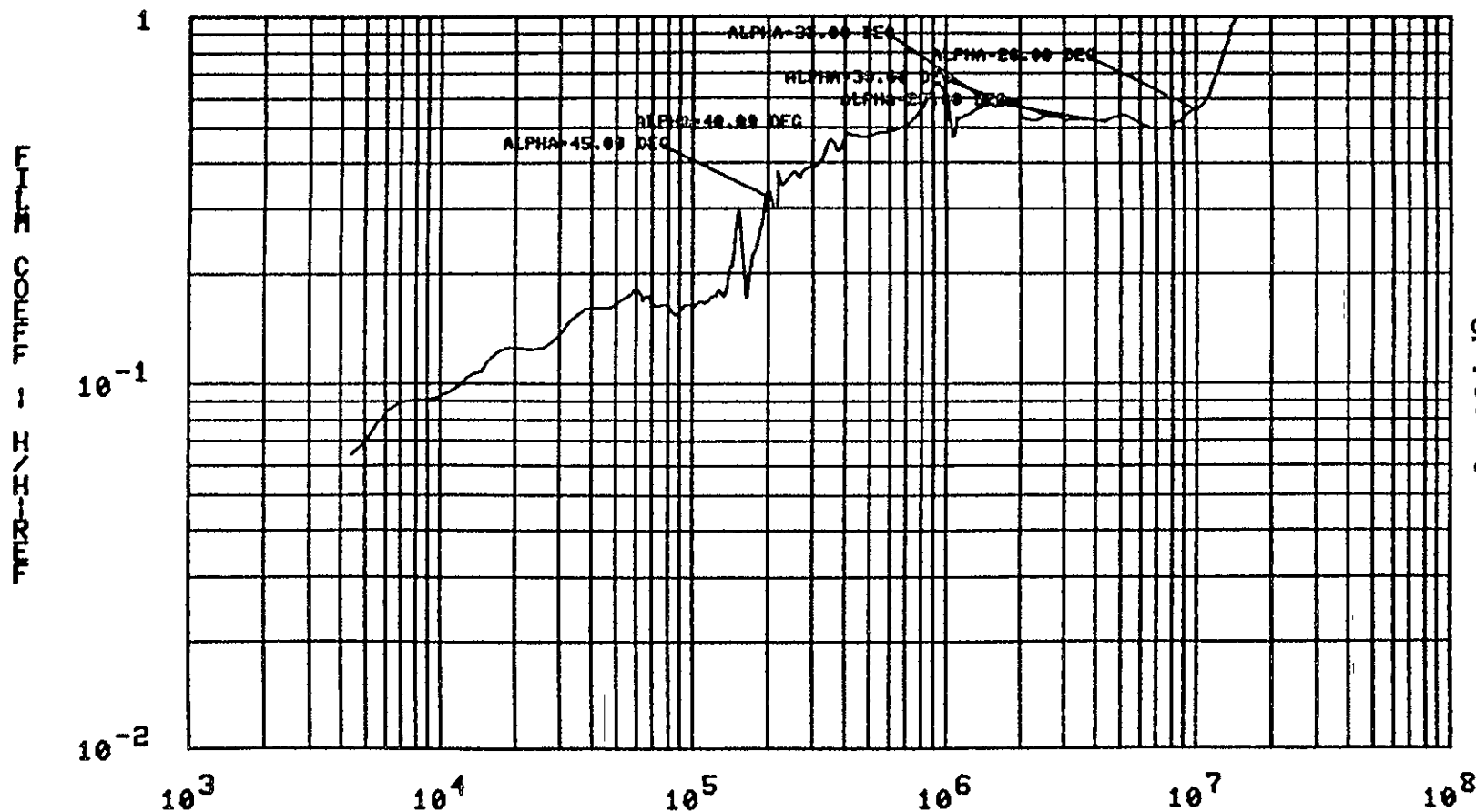
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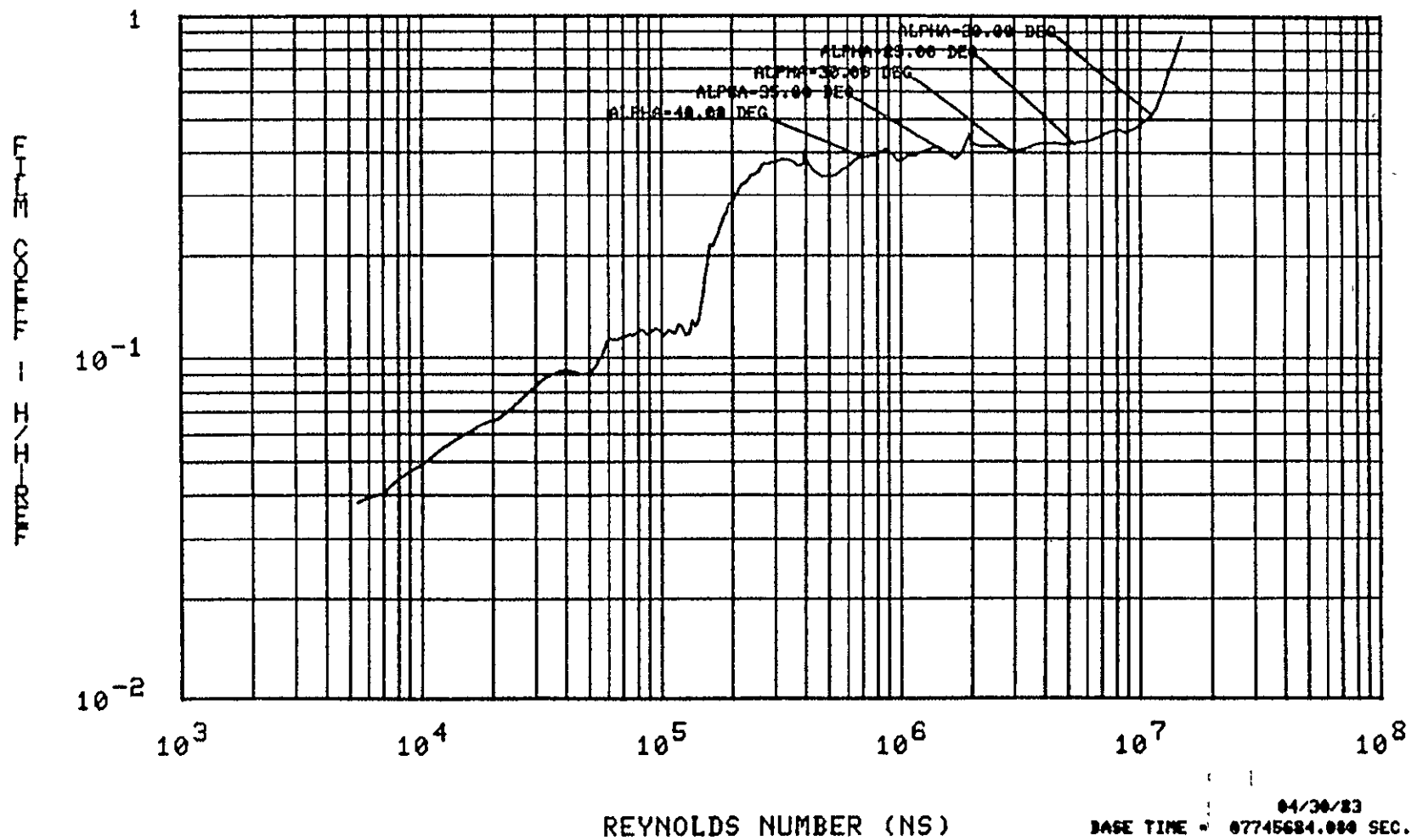
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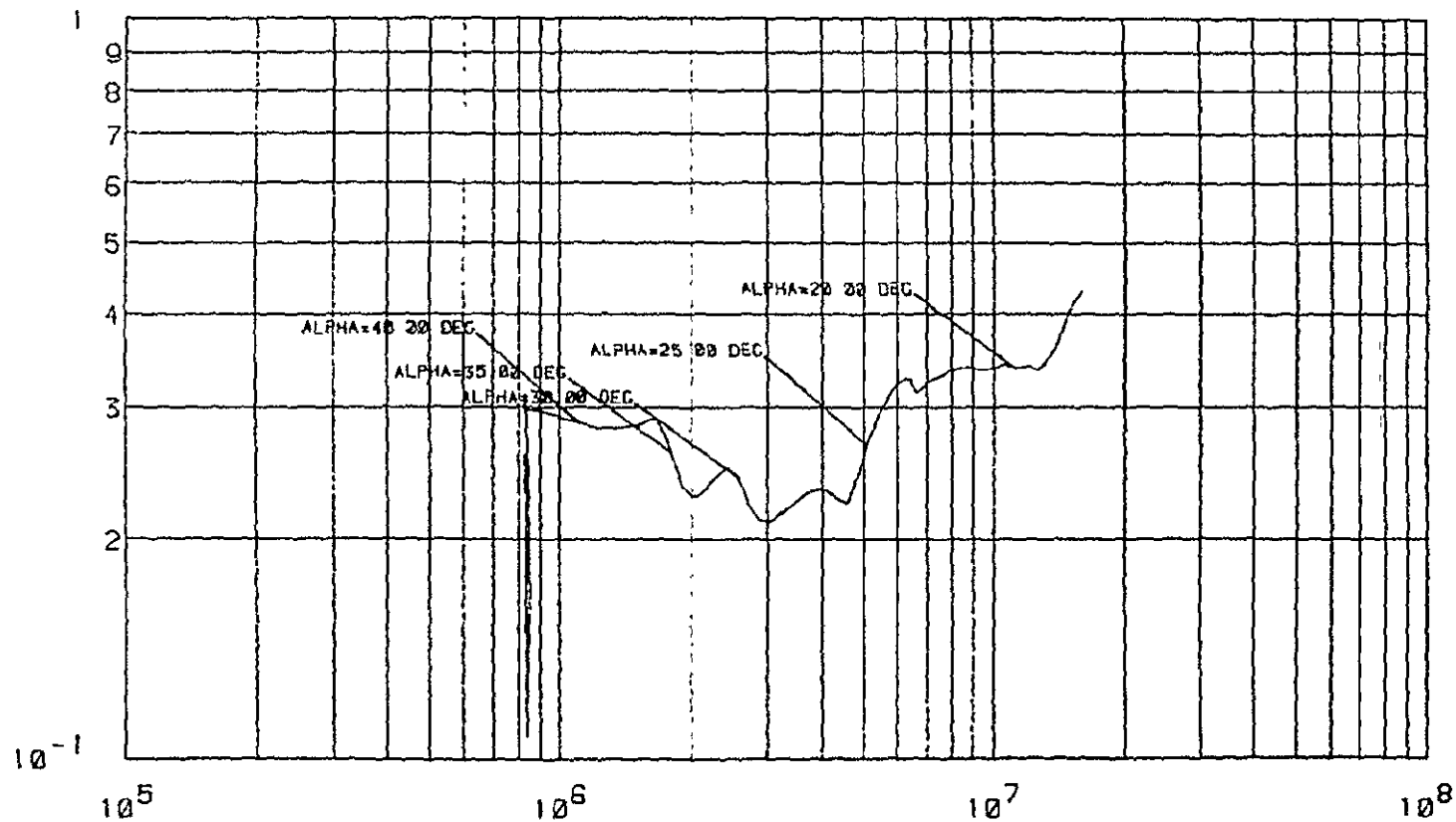
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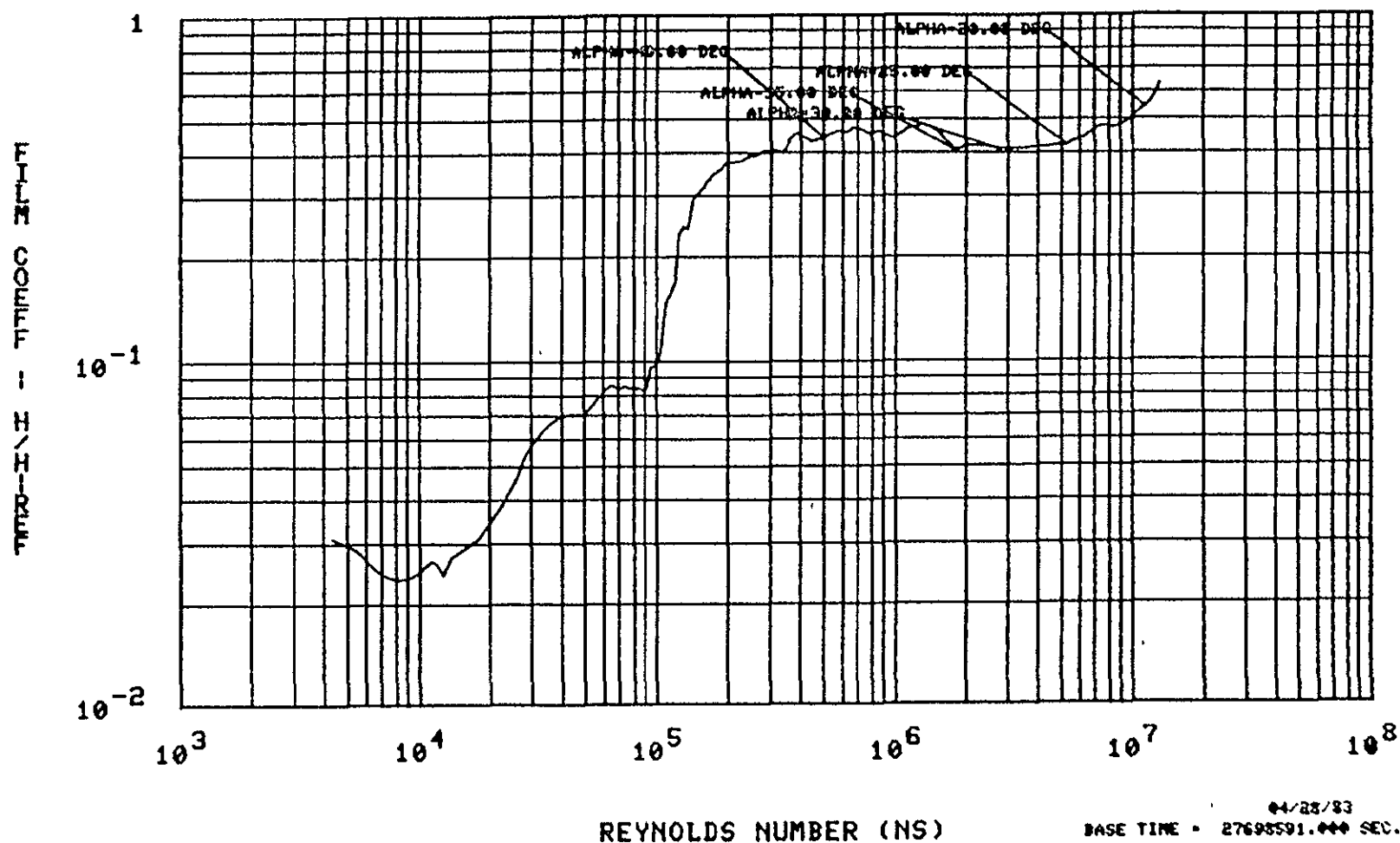
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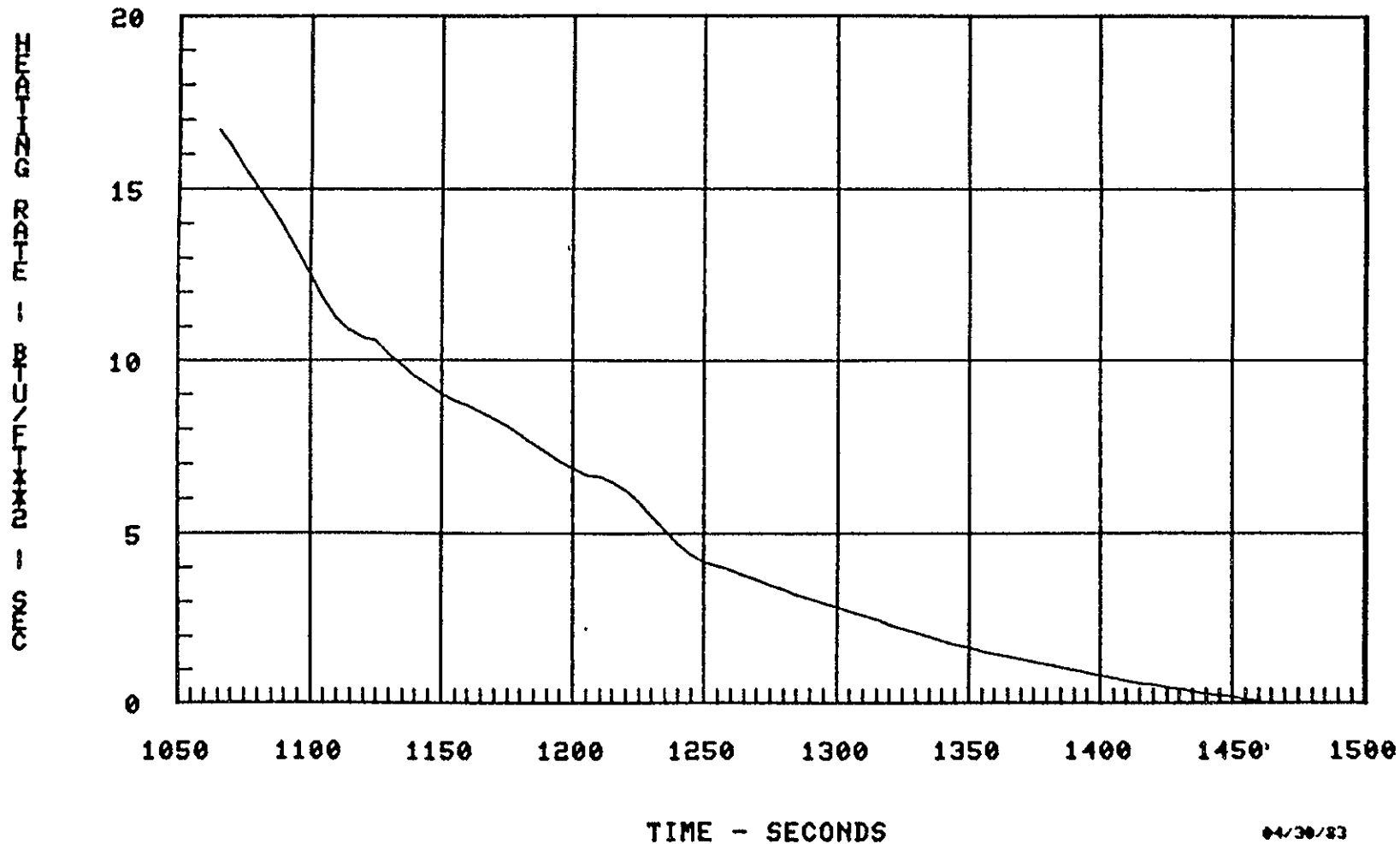
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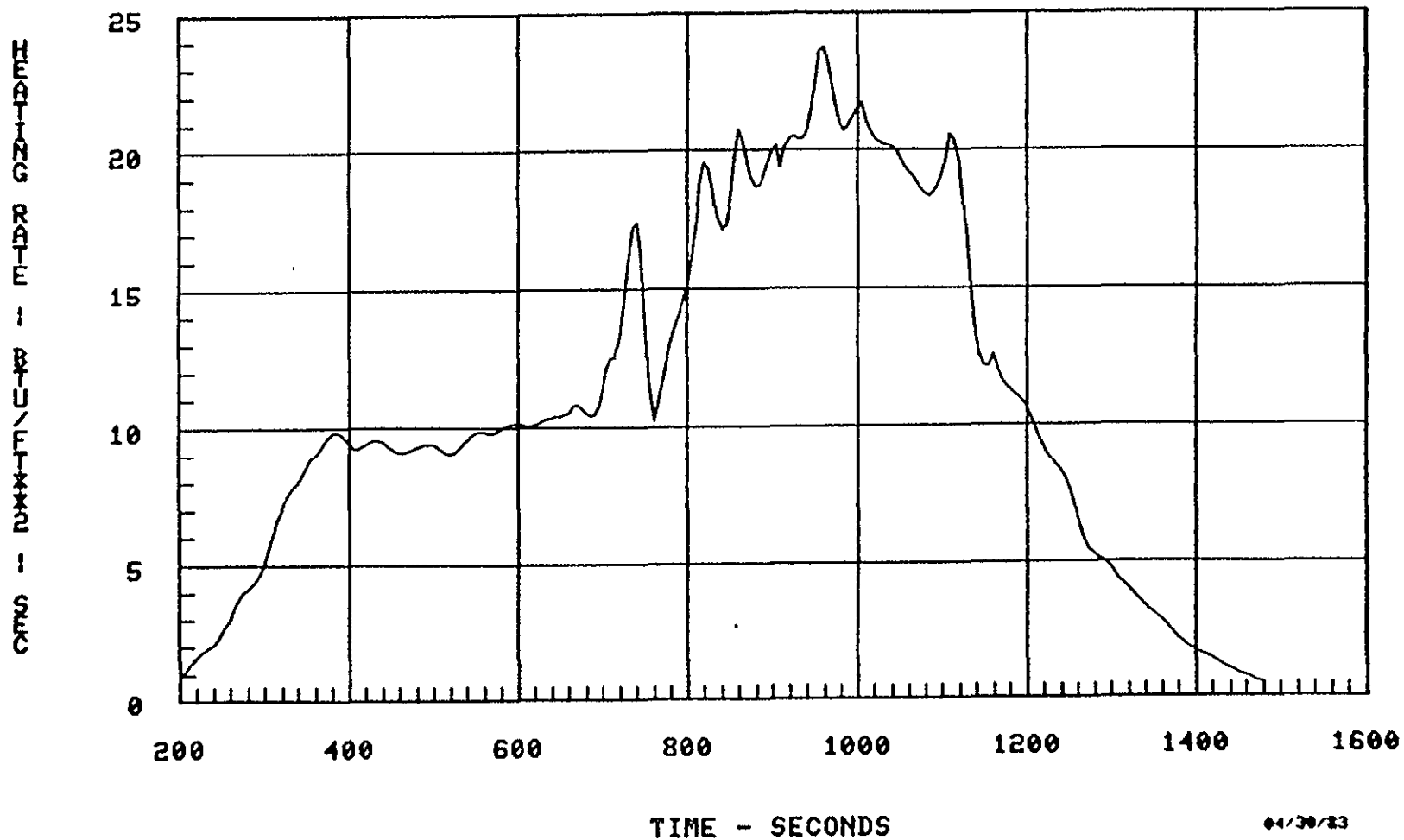


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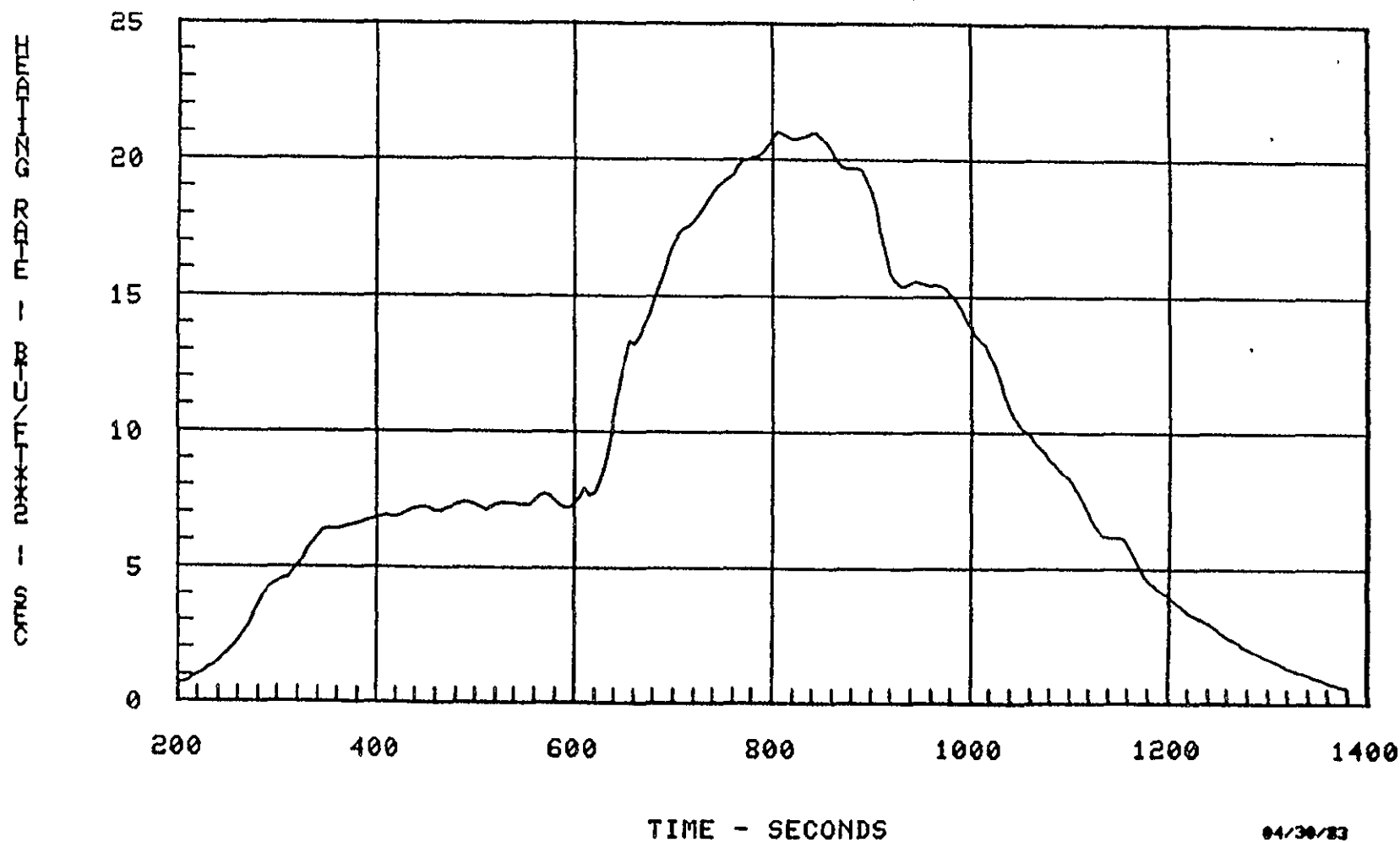
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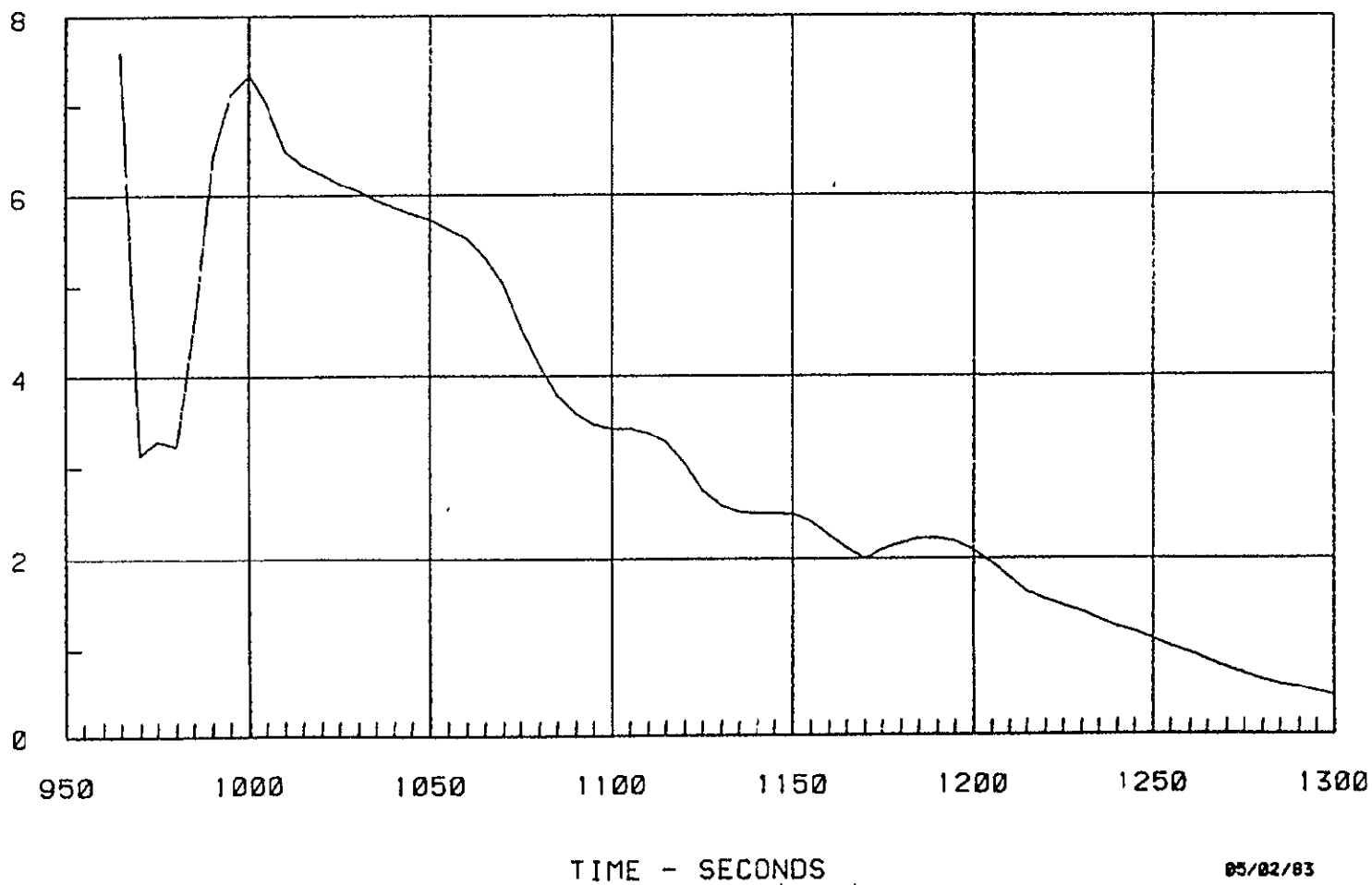
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B-469



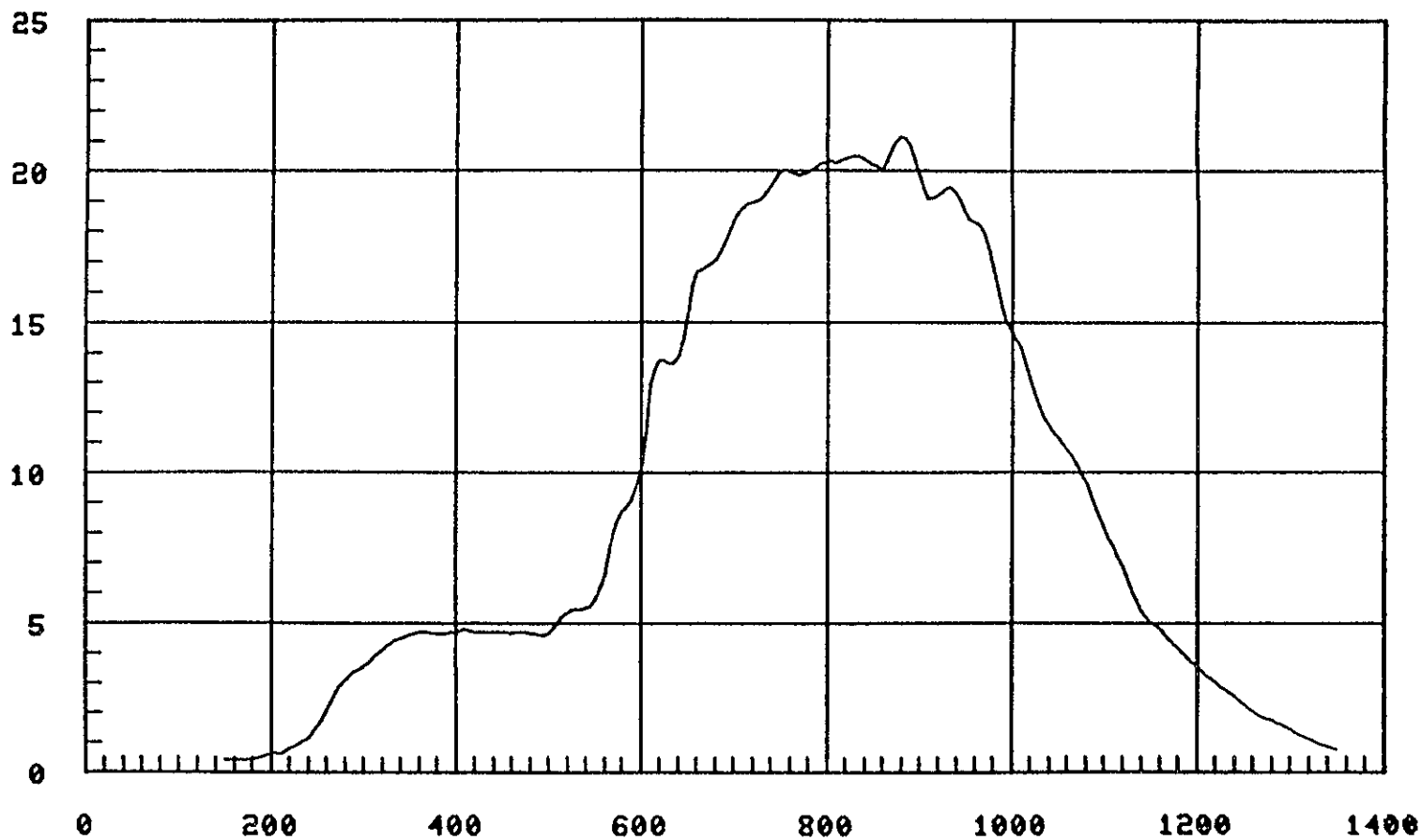
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TIME - SECONDS

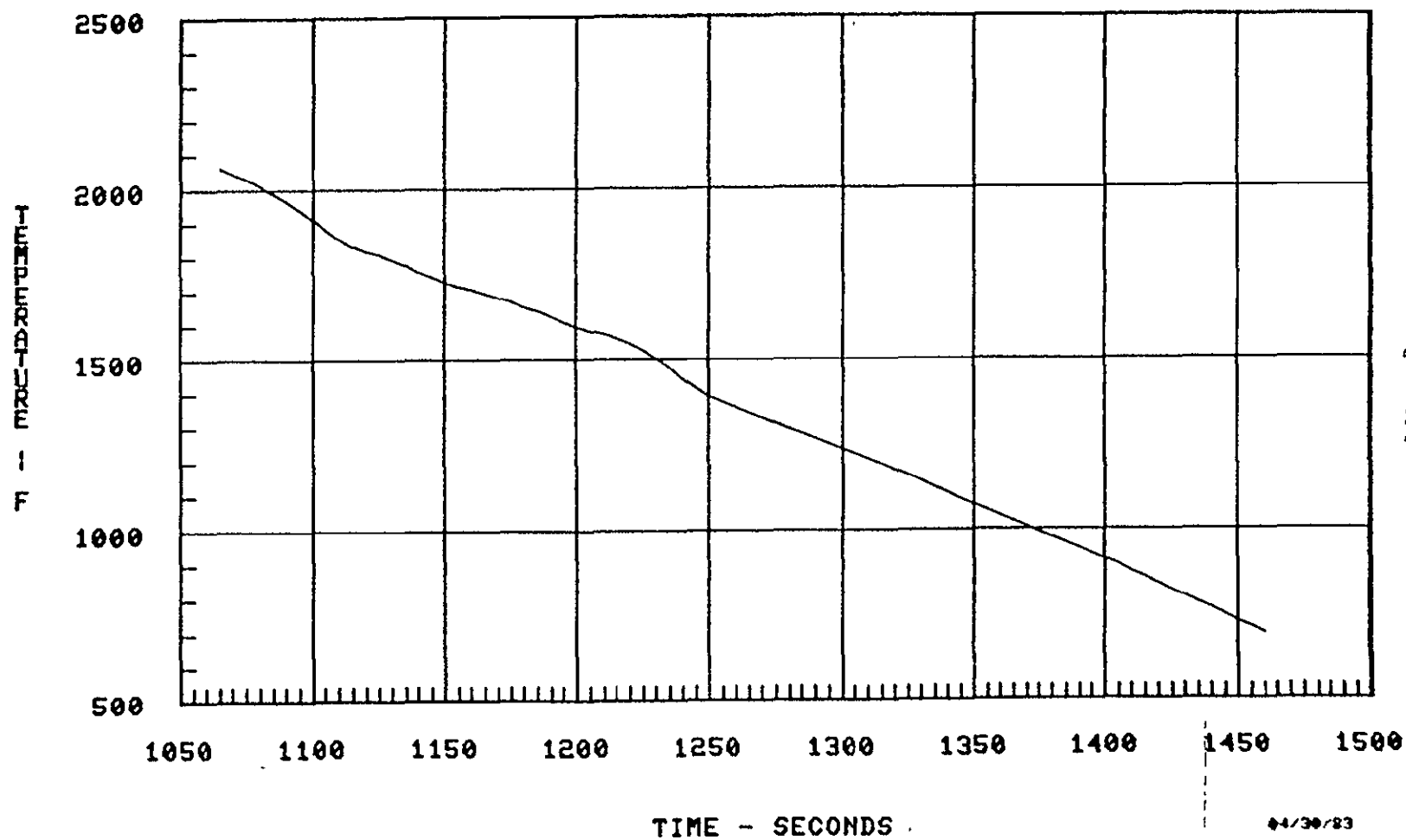
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STS-1 (107 FT LENGTH CL  $X/L=1.07$ ) FLIGHT PARAMETER COMPARISONS

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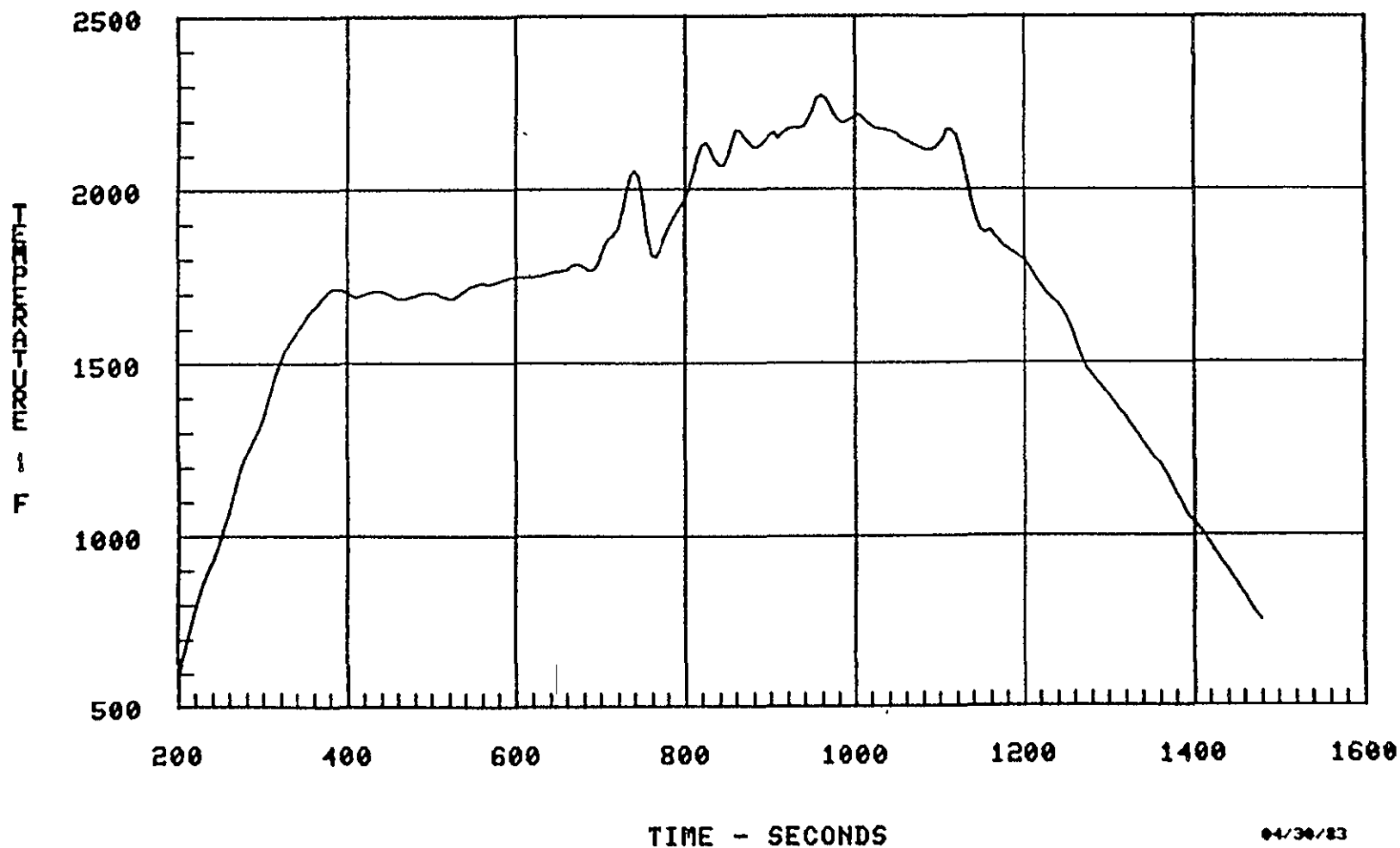
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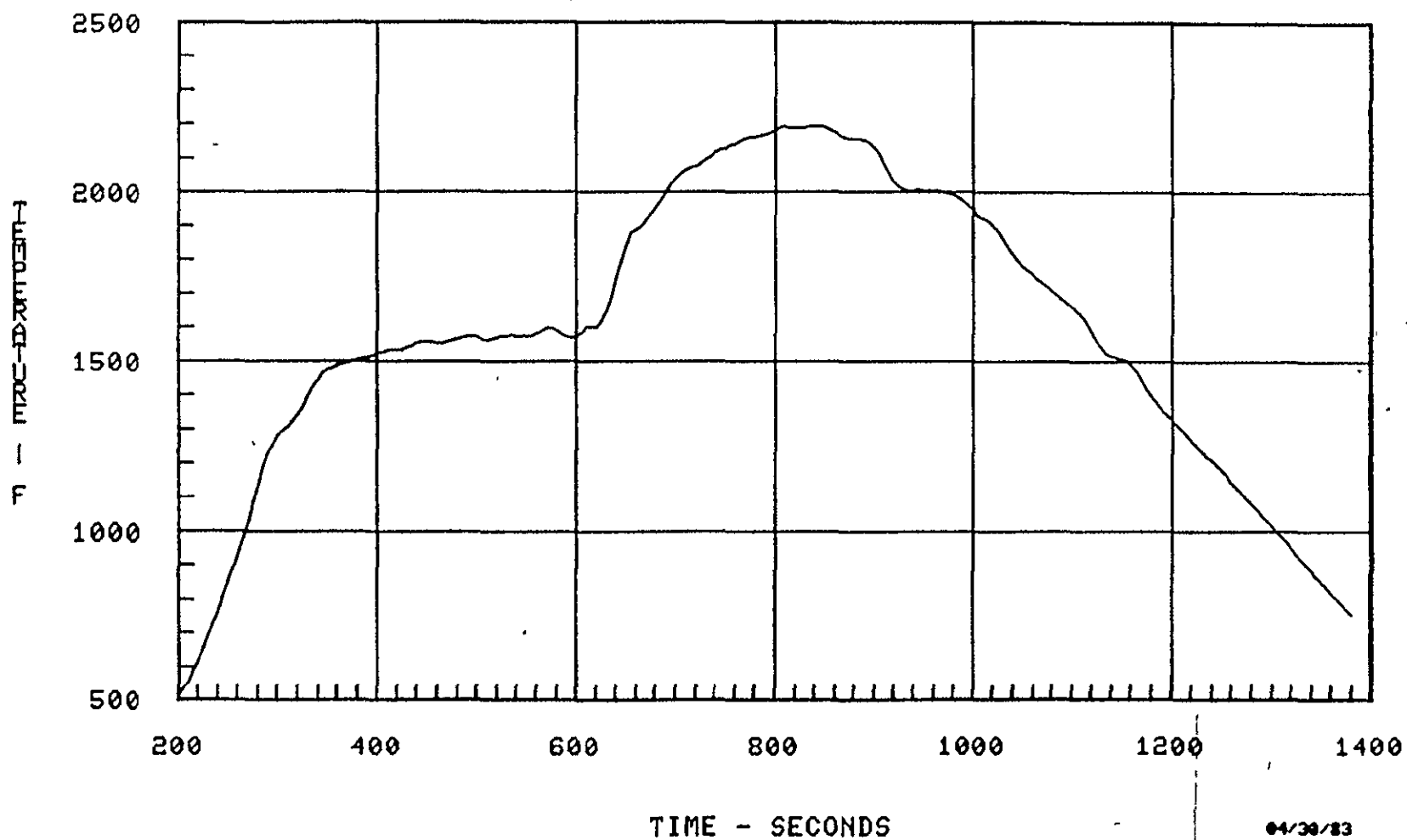
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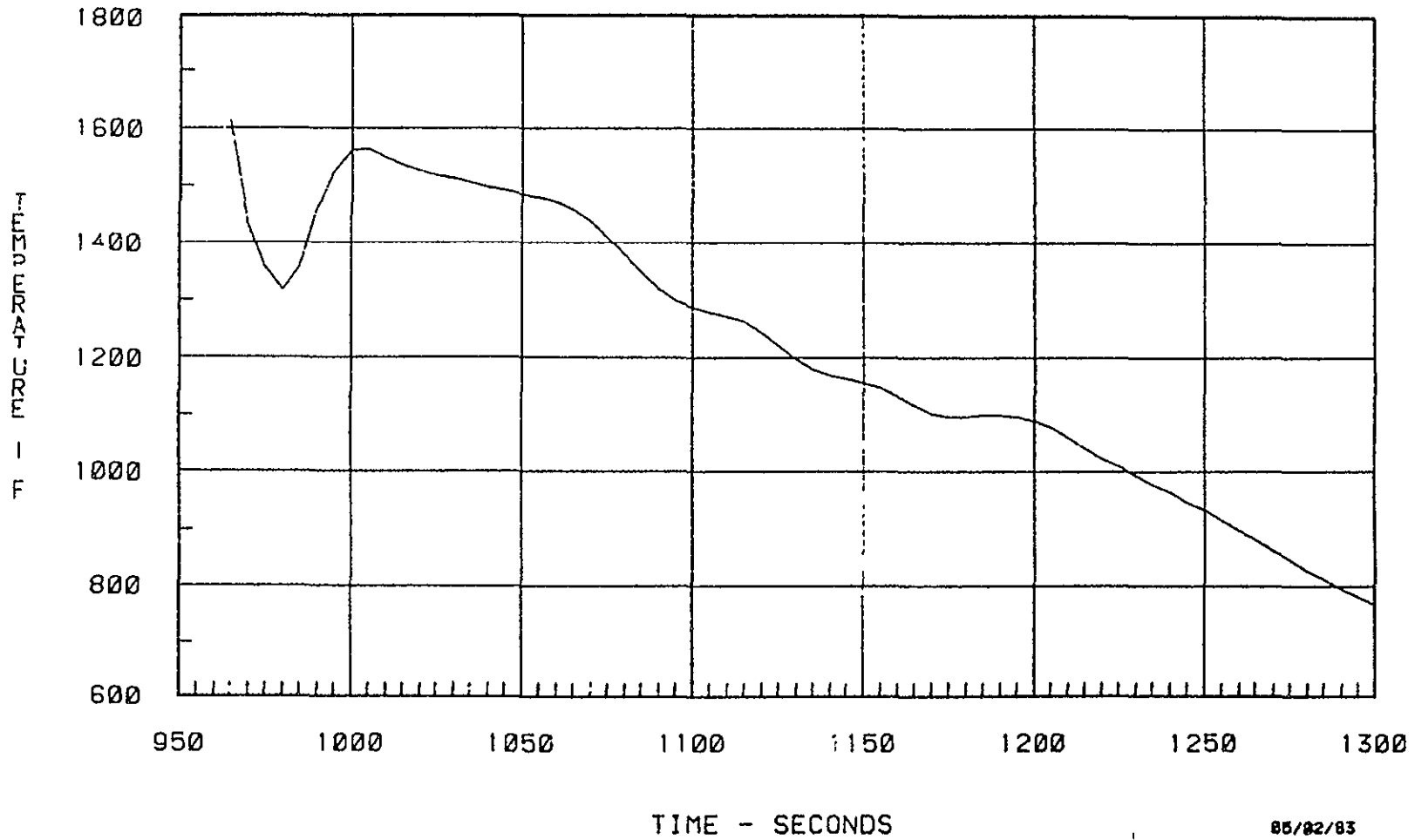
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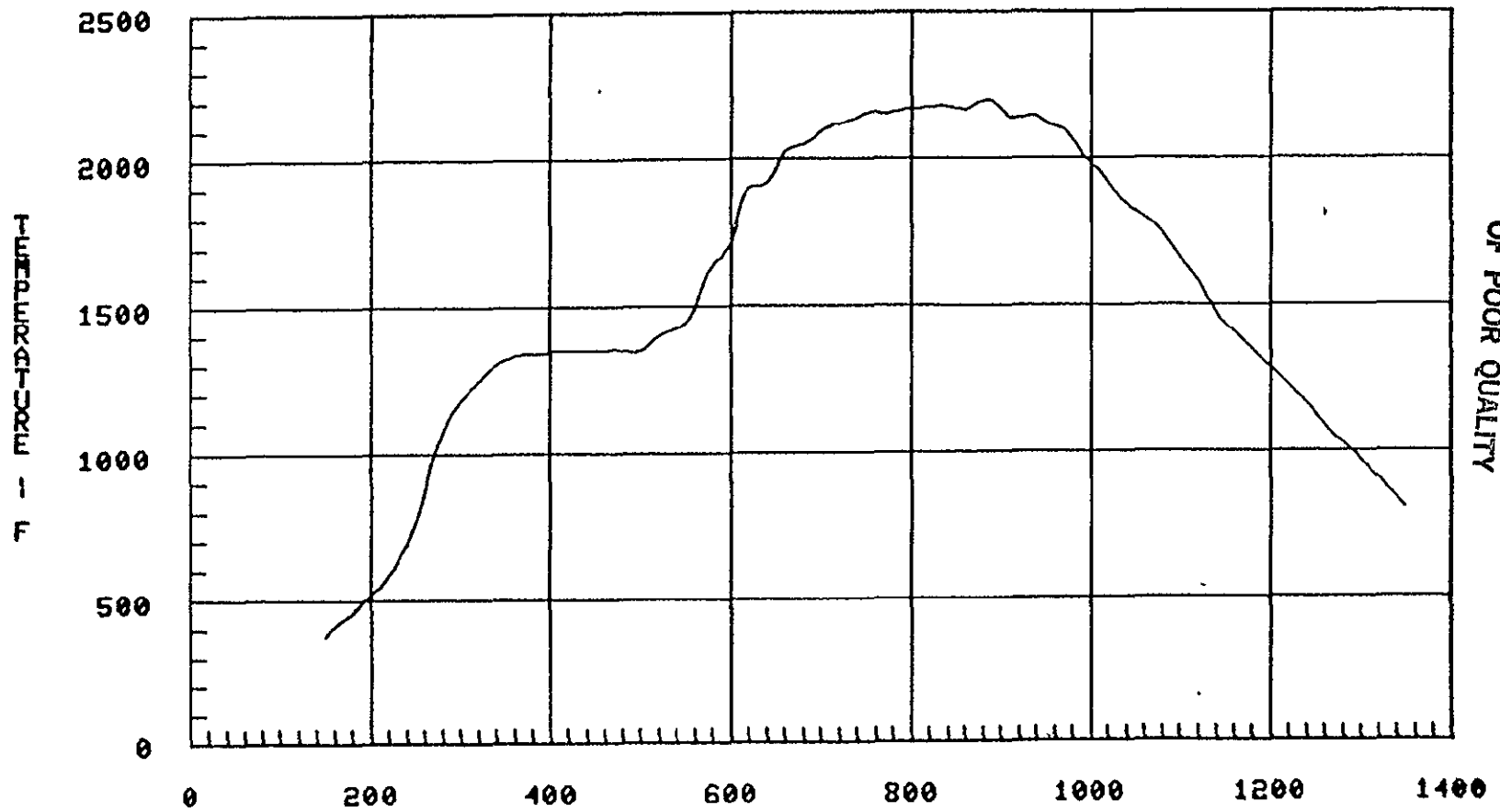
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85/82/83

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TIME - SECONDS

04-23-83

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				6. Performing Organization Code 24-50	
7. Author(s) S. D. Williams				8. Performing Organization Report No LEMSCO-19346	
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15. Supplementary Notes					
16. Abstract Entry heating flight data and wind tunnel data on the lower surface centerline are presented for the first five flights of the Space Shuttle Orbiter. The heating rate data is presented in terms of normalized film heat transfer coefficients as a function of angle-of-attack, Mach number, and Normal Shock Reynolds number. The surface heating rates and temperatures were obtained via the JSC NONLIN/INVERSE computer program. Time history plots of the surface heating rates and temperatures are also presented.					
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